

State Water Resources Control Board

Division of Water Rights

STAFF REPORT

RUSSIAN RIVER WATERSHED

Proposed Actions to be taken by
the Division of Water Rights
on Pending Water Right Applications
within the Russian River Watershed

August 15, 1997



STATE OF CALIFORNIA

Gray Davis, Governor

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

Winston H. Hickox, Secretary

**STATE WATER RESOURCES
CONTROL BOARD**

P.O. Box 100

Sacramento, CA 95812-0100

(916) 657-1247

Homepage: <http://www.swrcb.ca.gov>

James Stubchaer, Chairman

Mary Jane Forster, Vice Chair

John Brown, Member

Arthur G. Baggett, Jr., Member

Walt Pettit, Executive Director

Dale Claypoole, Deputy Director

TABLE OF CONTENTS

1.0 INTRODUCTION	1
1.1 General	1
1.2 Description of the Watershed	1
1.3 Fishery Resources	3
1.4 Board Workshops	4
1.5 Coordination with Other Agencies	5
1.6 Other Studies	5
2.0 WATER RIGHT PROCESS	7
2.1 Authority of the SWRCB	7
2.1.1 Water Code	7
2.1.2 Reasonableness	7
2.1.3 Public Trust Doctrine	7
2.1.4 CEQA	8
2.1.5 Fish and Game Code Section 5937	8
2.1.6 Endangered Species Act	8
2.2 Water Right Process	8
2.2.1 Protests	9
2.2.2 CEQA	9
2.2.3 Water Availability	9
2.3 Pending Applications	10
3.0 HYDROLOGY	16
3.1 General	16
3.2 Water Development Projects	18
3.2.1 Recorded Diversions	18
3.2.2 Potter Valley Project	19
3.2.3 Sonoma County Water Agency	20
3.3 Reservation	21
3.4 FAS Determination	22
3.5 Hydrologic Model	22
3.6 Analysis of Measured Flow Data	22
4.0 FISHERY RESOURCES	26
4.1 General	26
4.2 Population Trends	26
4.3 Life Stages	26
4.4 Proposed Flow Regime	27
4.4.1 Fall	27
4.4.2 Winter	28
4.4.3 Spring	28
4.4.4 Summer	28
4.4.5 Summary	29
4.5 Fishery Resources in the Main Stem	30
4.6 Barriers to fish Migration	30
4.7 Fish Screens	31

5.0 EVALUATION OF WATER AVAILABILITY	32
5.1 General	32
5.2 Wintertime Storage Projects	32
5.3 Spring Frost Protection	37
5.4 Projects on Main Stem	38
5.5 Municipal	38
5.6 Domestic	38
6.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS	39
6.1 Proposed Actions on Pending Applications	39
6.2 Fully Appropriated Stream	39
6.3 SCWA Applications/Petitions	40
6.4 Coordination	40

LIST OF TABLES

1. Summary of Unpermitted Applications - Mendocino County . . .	12
2. Summary of Unpermitted Applications - Sonoma County	13
3. Summary of Unaccepted Applications - Sonoma and Mendocino . .	15
4. USGS Gaging Stations within the Russian River Watershed . .	16
5. Recorded Water Rights within the Russian River Watershed . .	18
6. Summary of PG&E's Water Rights	19
7. Fully Appropriated Streams - Mendocino County	23
8. Fully Appropriated Streams - Sonoma County	23
9. Water Available for Appropriation	36

LIST OF FIGURES

1. Location Map - Russian River Watershed	2
2. Russian River Average Monthly Flow Comparison	17
3. Annual Russian River Flow at Guerneville	17
4. Monthly Exceedance Curves based on USGS Observed Data Collected from Macaama Creek above Kellog from 1961 to 1981	24
5. Flow Comparison in Maacama Creek Watershed	24
6. Observed Flow and Rainfall near Ukiah	25
7. Life Stages for Coho and Steelhead	27
8. Recommended Minimum Flow Regime and Allowable Diversion Season	29
9. Water Availability and Fish Flow Requirements in Austin Creek near Cazadero for Average and Dry Year conditions	33
10. Water Availability and Fish Flow Requirements in Maacama Creek near Cazadero for Average and Dry Year conditions	34
11. Water Availability and Fish Flow Requirements in West Fork Russian River near Cazadero for Average and Dry Year conditions	35

STAFF REPORT

PENDING WATER RIGHT APPLICATIONS WITHIN THE RUSSIAN RIVER WATERSHED

1.0 INTRODUCTION

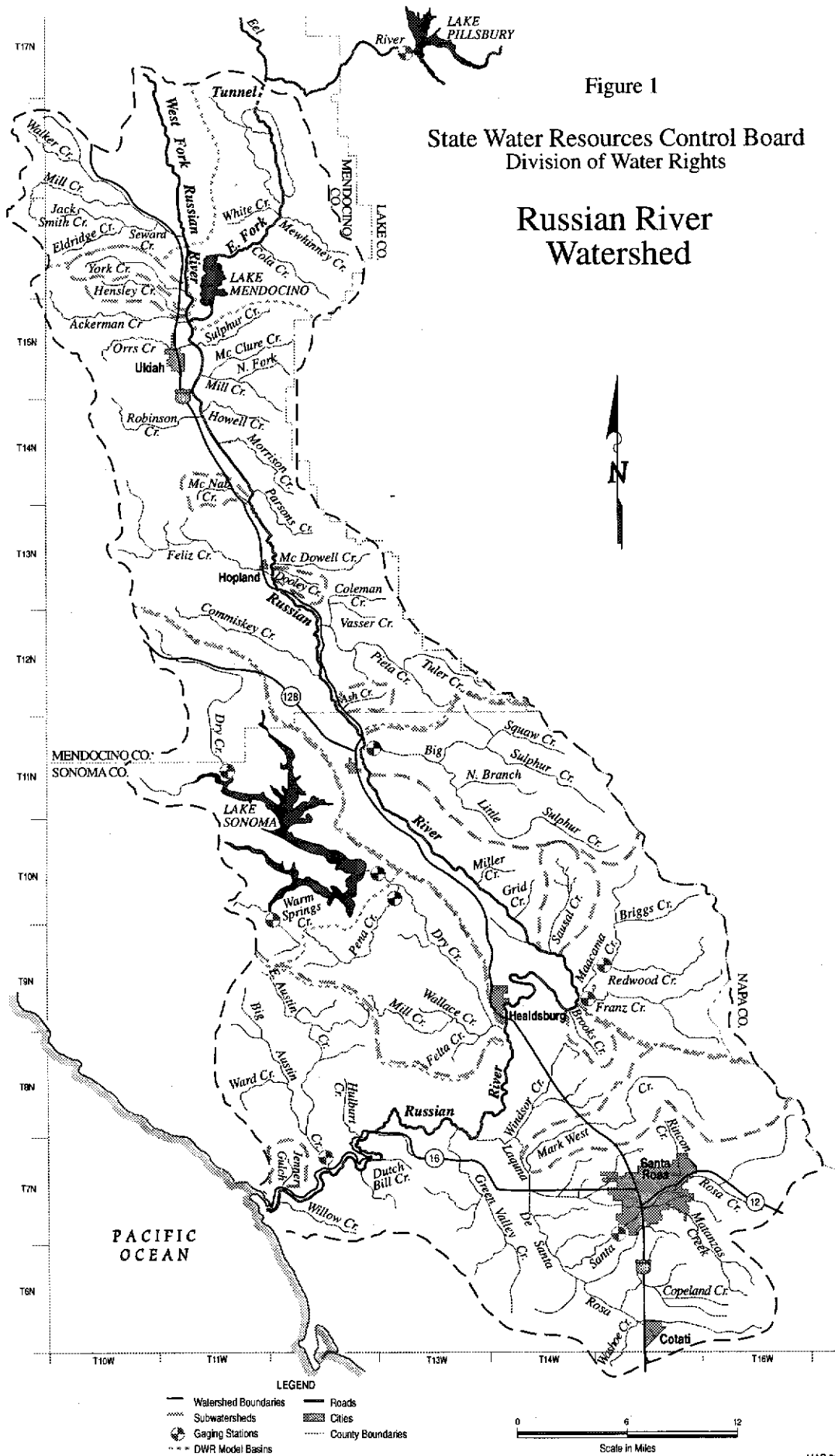
1.1 General The purpose of this report is to describe actions recommended by staff of the Division of Water Rights (Division) of the State Water Resources Control Board (SWRCB) on 81 pending water right applications and 12 incomplete/unaccepted applications within the Russian River watershed. This report describes these pending applications, discusses the methodology used to develop terms to protect fishery resources, evaluates water availability, and outlines the proposed process for acting on these applications.

The pending water right applications request diversion of a total of approximately 29,000 acre-feet of water per year (afa), primarily for irrigation, frost protection, industrial, municipal or domestic use. The 12 incomplete/unaccepted applications request a total of approximately 20,000 afa, primarily for frost protection, irrigation and domestic use. Of the 81 pending applications, 29 applications have been filed in Mendocino County requesting a total of 1,947 afa by direct diversion and 1,600 afa by storage; and 52 applications have been filed in Sonoma County requesting a total of 11,282 afa by direct diversion and 14,459 afa by storage. Of the 12 incomplete applications, 11 applications have been filed in Mendocino County requesting a total of 16,509 afa by direct diversion; and one application has been filed in Sonoma County requesting a total of 4,033 afa by direct diversion.

1.2 Description of the Watershed Figure 1 shows the Russian River watershed, major reservoirs, locations of watersheds with pending water right applications and other significant features within the watershed. The Russian River, which provides the water supply for approximately 500,000 people in Mendocino, Sonoma, and Marin Counties, encompasses an area of approximately 1,485 square miles within Mendocino and Sonoma Counties, including 23 major tributaries.

The Russian River is fed by the East and West Forks, approximately two miles north of the City of Ukiah, and by numerous tributaries. Streamflow in the river is measured at five locations -- Capella, Hopland, Cloverdale, Healdsburg, and Guerneville. Based on measured flows near Guerneville, the Russian River has an average annual runoff of approximately 1.6 million afa; however, flow has varied from a low of 64,000 afa during the 1976-1977 water year to a high of 4.3 million afa during the 1982-1983 water year.

The Russian River meanders in a southerly direction for a distance of 110 miles, through the Ukiah Valley, Hopland Valley, Alexander Valley, Fitch Mountains, Healdsburg Valley, and through the gorge of the Coastal Range Mountains to the Pacific Ocean at Jenner. Approximately 15 percent of the Russian River watershed is made up of level areas, most notably the Santa Rosa Plains, Alexander Valley, Hopland Valley, Ukiah Valley, Redwood Valley, and Potter Valley. The valleys are connected by mountainous gorge stretches along the



river's course. The remaining 85 percent of the river's watershed is comprised of hilly and mountainous terrain.¹

The Russian River valley areas have mostly been converted to agriculture (predominately vineyard) and grazing rangeland. Riparian habitat along the river, which has decreased by 34 percent along the river's middle reach during the period 1942 to 1990, exists in thin, discontinuous strips.² Within the river's upland areas, semi-natural vegetation consisting of conifer and hardwood forests, chaparral, and grasslands occur, with some conversion of oak woodlands to vineyard in hillside areas.³

Urban development within the Russian River watershed is concentrated around the communities of Potter Valley, Ukiah, Hopland, Cloverdale, Headsburg, Windsor, Forestville, Sebastopol, Santa Rosa, Rohnert Park, Cotati, and resort communities including Rio Nido, Monte Rio, Guerneville, Duncan Mills and Jenner. The largest concentration of people occurs in the Santa Rosa Plains, which includes six incorporated communities with over 200,000 residents. Industrial development within the watershed includes electronic manufacturing and other high-technology industries, petroleum distribution plants, light manufacturing, and other construction-related industries.⁴

The Division has records of 1,406 existing water diversions within the Russian River watershed in Mendocino and Sonoma Counties. These water development projects affect the flow in the main stem of the Russian River and the tributaries. Flow in the main stem of the Russian River is controlled, to a large degree, by the Sonoma County Water Agency's coordinated operation of Lake Mendocino and Lake Sonoma and by PG&E's operation of Potter Valley hydroelectric power project, which imports approximately 159,000 afa from the Eel River into the Russian River watershed.

1.3 Fishery Resources The Russian River watershed provides valuable habitat for coho salmon and steelhead trout. Coho and steelhead have been listed as an threatened species by the National Marine Fisheries Service (NMFS) under the Federal Endangered Species Act. In 1996, American Rivers, a national conservation organization, included the Russian River on their list of the twenty most threatened rivers in North America.

¹ U.S. Corp of Engineers, 1982, "Russian River Basin Study, Northern California Stream Investigation, Final Report.

² Sonoma County Water Agency, 1996, "Water Supply and Transmission System Project; Draft Environmental Impact Report", Vol. 1, Santa Rosa, California, vii and 511 pp.

³ Circuit Rider Productions, Inc., 1994, "Riparian habitat Status Report", Winston, California, pp 22.

⁴ Regional Water Quality Control Board, September 25, 1996, draft report relating to water quality problems, pp 2.1-3.

The condition of coho and steelhead depends on the proper combination of flow, temperature, water quality, substrate, cover and riparian habitat. The most important habitat for fish is provided by the tributaries, rather than the main stem of the river. Numerous factors have adversely affected the fishery resources including construction of water development projects, barriers to migration, gravel mining operations, timber management practices, adjacent land use, introduction of non-native fish, hatchery operations, and commercial ocean fishing. The SWRCB has authority to control factors related to water development projects, however, the SWRCB has limited authority to control many of the other factors affecting the fishery resources. Studies to address many of these issues are currently being conducting by several federal, state and local governmental agencies, and by local resources conservation districts.

1.4 Board Workshops On January 4, 1995, the SWRCB held a workshop to receive comments and recommendations regarding possible courses of action that should be taken to address water right issues on the Russian River. Based on comments presented at that workshop, staff recommended a multi-phased strategy to address water right issues:

Phase 1 Conduct an environmental assessment of the potential cumulative effects on river flows of the pending water right applications and develop permit terms that would avoid cumulative impacts.

Phase 2 Process pending applications and petitions that do not have significant impacts, or that include specific permit terms that would mitigate for local and cumulative impacts.

Phase 3 Act on Sonoma County Water Agency's petitions to change existing water right permits on the main stem of the river, following completion of appropriate environmental documentation.

Phase 4 Hold a hearing to determine which streams in the watershed are fully appropriated and the season that is fully appropriated.

Phase 5 Assist in the development of a basin-wide management plan for the Russian River watershed.

This staff report is a continuation of the multi-phased strategy and describes specific activities relating to phases 1 and 2. Following completion of the activities outlined in this report, the SWRCB can hold a hearing to determine whether streams are fully appropriated, i.e., phase 4 of the proposed strategy. SCWA is presently completing an EIR relating to proposed changes in their water right permits and intends to submit an application and petitions. Division staff will act on SCWA's application and petitions (i.e., Phase 3) following receipt of the application and petitions and the accompanying EIR. Division staff will continue to participate in on-going efforts that are designed to develop basin-wide management plans, i.e., phase 5 of the multi-phased strategy.

On November 7, 1996, the SWRCB held a second workshop to bring together various agencies and groups to promote coordinated actions to protect the anadromous fish in the Russian River. That workshop was held, in large measure, as the result of requests by the Friends of the Russian River and the National Heritage Institute. There was

general consensus that a comprehensive watershed management plan is needed to provide long-term improvement to the fishery resources.

1.5 Coordination with other Agencies Several agencies are currently conducting studies, developing management plans, or implementing measures to improve conditions affecting the fishery resources within the Russian River watershed. Division staff will continue to participate in studies leading to development of watershed plans. The measures proposed in this staff report will complement watershed management planning efforts being conducted by other agencies.

1.6 Other Studies The following provides a brief description of some of the other on-going studies of the Russian River watershed that are being conducted by other agencies. In most cases, these are cooperative efforts involving federal, state and local agencies, environmental organizations, representatives from industries in the area, and volunteer and/or community groups. In many cases, agencies other than the SWRCB have primary authority to control specific factors that affect fishery resources.

Corps The U.S. Army Corps of Engineers (Corps) is conducting the Russian River Ecosystem Restoration Reconnaissance Study. The purpose of the study is to determine whether operation of Coyote and Warm Springs dams should be modified in the interest of environmental protection and restoration, erosion control and streambank protection, groundwater supplies and other purposes.

SCWA Sonoma County Water Agency (SCWA) initiated an effort to secure federal and state funding for projects that would restore and enhance fishery resources within the watershed. SCWA recently released a report entitled *Russian River Action Plan, A Regional Assessment of Resource Needs and Restoration Opportunities*. That report provides additional information relating to on-going studies within the watershed. SCWA also distributes the *Russian River Bulletin*. That newsletter is circulated to governmental agencies to facilitate coordination, communication and cooperation among agencies with on-going activities in the watershed.

RWQCB The North Coast Regional Water Quality Control Board (RWQCB) has developed a five-year Watershed Management Program for the Russian River watershed, which includes:

- . Problem identification and assessment (FY 95-96),
- . Assessment and implementation actions (FY 96-98),
- . Implementation of actions (FY 98-99), and
- . Evaluation of the implementation and feedback (FY 99-2000).

The RWQCB's goals and actions for improving water quality within the Russian River watershed include:

- . Protecting surface water and groundwater,
- . Protecting cold and warm water fisheries,
- . Protecting aquatic life and public health in Bodega Harbor, and other activities.

California Coastal Conservancy The California Coastal Conservancy is coordinating activities leading to the development of a Russian River Resource Enhancement Plan for Mendocino and Sonoma Counties. Two specific studies have been completed. The Russian River Estuary Study describes measures relating to the

overall management of the estuary. A second report describes geomorphical conditions of the river.

DFG The goal of the California Department of Fish and Game (DFG) in the Russian River watershed is to preserve the biodiversity of the Russian River salmon and steelhead. DFG has developed a Russian River Basin Planning Project with the objective of developing a Fishery Action Plan for the Russian River. The focus of the project has been to conduct continuing surveys of selected streams, based on each stream's value for salmon or steelhead habitat and existing community interest in preservation or restoration. DFG is currently preparing an EIR relating to the removal of barriers to fish passage at the Healdsburg dam.

NMFS The National Marine Fishery Service (NMFS) has oversight responsibilities for activities within the Russian River basin, including:

- . PG&E Potter Valley Hydroelectric Project. NMFS provided engineering support and advice for fish screen installation.
- . Gravel extraction. NMFS developed recommendations for fishery protection measures.
- . Corp of Engineer permit applications. NMFS reviews all proposals.
- . Healdsburg Dam Fish Ladder. NMFS provides engineering support and advice.

SRCD The goal of the Sotoyome Resource Conservation District (SRCD) is to promote watershed stewardship, education and technology transfer through grant projects as well as through other activities in which other agencies are involved. SRCD is working with the Goldridge and Mendocino Resource Conservation Districts and other agencies to coordinate watershed planning efforts. Among several other watershed planning and restoration activities, SRCD has been coordinating watershed restoration efforts with the staff from 11 other governmental agencies. In addition, SRCD using grant award funds has implemented projects to develop a broad coalition of agencies, landowners, students, and community groups to improve water quality in the Sonoma County section of the Russian River.

Sonoma County The Sonoma County Board of Supervisors has directed that a supplemental EIR on the County's Aggregate Resources Management Plan be prepared for the instream gravel mining in the Russian River.

Mendocino County The Mendocino County Board of Supervisors is scheduled to review the Upper Russian River Aggregate Resources Management Plan.

2.0 WATER RIGHT PROCESS

2.1 Authority of the SWRCB The authority of the SWRCB on water right issues is defined primarily by the Water Code and the California Code of Regulations (Regulations). The Water Code and Regulations specify procedures that the SWRCB must follow when acting on applications for water right permits. In addition, the SWRCB must comply with the provisions of the California Environmental Quality Act (CEQA) and the California Endangered Species Act (CESA). All permits that are issued by the SWRCB must also comply with the "reasonableness" criteria, as defined in Article X, section 2 of the California Constitution, and must also take into consideration the public trust doctrine, as articulated by the California Supreme Court in the Audubon Decision. The following provides a brief discussion of these requirements as they relate to SWRCB review of pending water right applications within the Russian River watershed.

2.1.1 Water Code Water Code section 100 states that the SWRCB shall maximize the beneficial uses of the water resources of the state. Beneficial uses of water include offstream consumptive uses to include municipal, domestic, and irrigation use, as requested in the pending applications. Water Code section 1243 states that the use of water for recreation and the preservation and enhancement of fish and wildlife resources is a beneficial use of water. Section 1243.5 states that, "In determining the amount of water available for appropriation, the [SWRCB] shall take into account, whenever it is in the public interest, the amounts of water needed to remain in the source for protection of beneficial uses...".

2.1.2 Reasonableness Water Code section 275 proscribes the unreasonable use, unreasonable method of use, or unreasonable method of diversion of water. A memo⁵ prepared by the SWRCB Chief Counsel describes an approach for determining reasonableness. An evaluation of reasonableness requires a case-by-case evaluation of the specific facts relating to a proposed use of water. The memo provides a list of over 20 court cases and/or SWRCB decisions that determined whether a particular use of water was reasonable.

2.1.3 Public Trust Doctrine In the Audubon decision, the California Supreme Court states that "The state has an affirmative duty to take the public trust into account in the planning and allocation of water resources, and to protect public trust uses whenever feasible." The decision states that "... the function of the Water Board has steadily evolved from the narrow role of deciding priorities between competing appropriators to the charge of comprehensive planning and allocation of waters. This change necessarily affects the board's responsibility with respect to the public trust." The decision states that the SWRCB "... in undertaking planning and allocation of water resources, is required by statute to take [public trust] interests into account". The decision states that recent legislation "... made clear [the SWRCB's] authority to weigh and protect public trust values." Similar to provisions in the Water Code, the Audubon decision indicates that the SWRCB must maximize beneficial uses of

⁵ Memo by William R. Attwater, Chief Counsel dated December 20, 1982.
Subject: Analysis of the law of waste and unreasonable use of water.

water. Finally, the decision affirms that the SWRCB "... has the power and duty to protect such [public trust] uses by withholding water from appropriation."

2.1.4 CEQA CEQA imposes responsibilities on the SWRCB in addition to those imposed by the Water Code and the public trust doctrine. When the SWRCB is the "lead" agency, the SWRCB must conduct an environmental review and prepare an environmental document that describes the potential environmental impacts that could result from the proposed project. Whenever feasible, the SWRCB must adopt conditions that would avoid or mitigate adverse environmental effects, that are within the SWRCB's jurisdiction.

2.1.5 Fish and Game Code Section 5937 Section 5937 of the Fish and Game Code provides, in pertinent part:

"The Owner of a dam shall allow sufficient water at all times to pass through a fishway, or in the absence of a fishway, allow sufficient water to pass over, around or through the dam, to keep in good condition any fish that may be planted or exist below the dam."

The State Water Board has the authority, when it issues a water right permit, to apply Section 5937 of the Fish and Game Code.⁶ Since 1975, the State Water Board has required that permits throughout the state include a term implementing Section 5937 of the Fish and Game Code.⁷

2.1.6 Endangered Species Act Coho and steelhead have been listed as threatened species by the National Marine Fisheries Service (NMFS) under the Federal Endangered Species Act. The practical result of the federal listings is that the SWRCB must place emphasis on the instream flow and other measures needed to protect these fishery resources. Failure to provide measures to protect fishery resources could subject future permittees to sanctions under provisions of section 9 of the Federal Endangered Species Act.

The issuance of a water right permit by the SWRCB does not authorize any activity that would result in a "take" of any species protected by the Federal Endangered Species Act, nor does the possession of a water right permit issued by the SWRCB authorize diversion in a manner that would result in a "take" of any endangered species.

Coho and steelhead are also being considered for listing under the California Endangered Species Act (CESA). The SWRCB must comply with the consultation requirements of CESA, if these fish are designated as threatened or endangered species.

2.2 Water Right Process A water right permit authorizes a person to divert a specific quantity of water from a stream during a particular season for specific purposes of use and place of use. An

⁶ (See 57 Ops.Cal.Atty.Gen 577 (1974).)

⁷ (23 Cal. Code Reqs. sec. 782)

appropriative water right permit is based on the concept of "first in time, first in right", i.e., permittees with later application numbers cannot divert water until permittees with earlier application numbers have satisfied their water rights. The following provides a brief description of the major steps in the process to obtain a water right permit from the SWRCB. It should be noted that, in most cases, the person requesting a water right permit must also obtain permits and/or approvals from other governmental agencies.

2.2.1 Protests The Division distributes a notice of each water right application to interested parties. Any party can submit a protest against the application based on a claim of injury to existing water rights, injury to the environment, or a claim that approval of the application is not in the public interest. All protests must provide facts to support the allegations, in accordance with section 745(c) of the Regulations. All protests must be resolved before a water right permit can be issued. There are several procedures for resolving protests:

Negotiation The applicant and protestant can negotiate terms that are acceptable to both parties to resolve issues raised in the protests.

Field Investigations On minor projects (i.e., direct diversion of 3 cfs or less or storage of 200 afa or less) with unresolved protests, Division staff must conduct a field investigation and prepare a staff analysis, in accordance with Water Code section 1345 et seq. Staff issues a permit in accordance with the recommendations contained in the staff analysis, unless a party submits objections and requests a hearing.

Hearing On major projects, a water right hearing must be held to resolve the issues raised by the protests that are not resolved by negotiation.

2.2.2 CEQA Approval of an application is a discretionary action and, as such, requires that the Division comply with the provisions of CEQA, in accordance with Public Resources Code section 21000 et seq. When approving an application to appropriate water, the SWRCB is either a "lead" agency or a "responsible" agency, as defined by CEQA. Some applications have been submitted by public agencies. On those application, the public agency will be the lead agency and the SWRCB will be the responsible agency. On most pending applications within the Russian River, the SWRCB will be the lead agency and will conduct an evaluation of the potential environmental impacts, determine mitigation measures, and prepare the appropriate environmental document.

2.2.3 Water Availability The Division must determine that water is available for appropriation in accordance with Water Code section 1375. The primary focus of this staff analysis is to determine whether water is available for appropriation within the Russian River watershed. A determination of water availability must consider the flow in the stream for different seasons and types of water years (i.e., wet, normal and dry), the amount of water needed to satisfy existing water rights, and the instream flow needed to protect fishery resources. A water availability determination must also consider limitations imposed by previous SWRCB decisions, including the conditions imposed by Decision 1030

and Decision 1610. Determining the availability of water within the Russian River watershed is a difficult task, for several reasons:

Hydrology On most tributaries, there are no gages and limited data available to define the streamflow, particularly during low flow conditions. The Division developed a hydrology model to estimate the unimpaired (or natural) flow in the tributaries.

Fishery needs No comprehensive study has been conducted to define the flow regime needed to protect the fishery resources within the main stem of the Russian River or most tributaries. Division staff have developed recommended fish bypass flows based on consultation with DFG and other fishery agencies, a review of the literature, and a review of fishery studies conducted on two streams within the Russian River watershed and two streams in the vicinity of the Russian River.

Existing diversions The Division does not have complete records of existing diversions within the watershed, for several reasons. The Division does not have a complete record of all riparian and pre-1914 water rights and does not have accurate information relating to quantities of water diverted under those rights. Diverters have flexibility in the operation of their facilities. For example, storage in reservoirs can depend on flood control criteria or power release requirements; diversions for irrigation can depend on the crop and season; diversions for frost protection can depend on weather conditions.

Effects of SWRCB Decisions and Orders Determination of water availability is further complicated by conditions contained in SWRCB Decisions 1030 and 1610. Those decisions limit the allowable season of diversion, establish instream flow requirements and reserve quantities of water for appropriation within Sonoma and Mendocino counties.

2.3 Pending Applications Tables 1 and 2 provide a summary of the 81 pending water right applications within the Russian River watershed. Of the 81 pending applications, 29 applications have been filed in Mendocino County requesting a total of 1,947 afa by direct diversion and 1,600 afa by storage. A total of 52 applications have been filed in Sonoma County requesting a total of 11,282 afa by direct diversion and 14,459 afa by storage. Of the 29 applications filed in Mendocino County, 12 applications request water rights on the main stem of Russian River (i.e., 1,460 afa by direct diversion and 243 afa by storage) and 17 applications are located within various tributary watersheds (i.e., 487 afa by direct diversion and 1,357 afa by storage). Of the 52 applications filed in Sonoma County, 7 applications request water rights on the main stem of Russian River (i.e., 5,269 afa by direct diversion and 28 afa by storage) and 45 applications are located within various tributary watersheds (i.e., 6,013 afa by direct diversion and 14,431 afa by storage). As indicated on Tables 1 and 2, the applications are for several purposes of use including irrigation, frost protection, municipal, domestic, power generation, and recreation.

Table 3 provides a summary of the 12 incomplete water right applications that have been submitted, but not accepted by the Division. All 12 incomplete/unaccepted applications request diversion from the main stem of the Russian River. Of the

12 applications, 11 are located in Mendocino County and request a total of 16,509 afa by direct diversion for irrigation and frost protection purposes. The one application located in Sonoma County requests a total of 4,033 afa for municipal purposes.

TABLE 1

Summary of Unpermitted Applications - Mendocino County

STREAM SOURCE WATERSHED	APP. NUMBER	APPLICANT	DIRECT DIVERSION (CFS)	STORAGE DEMAND (AF)	USE	SEASON
MAIN STEM RUSSIAN RIVER	29525	NELSON	1.94	0	I, N, L	6/1-9/15
	29526	NELSON	3.0	0	I, N, L	3/1-5/15
	29591	JOHNSON ORCHARDS	2.22	0	N	2/15-5/15
	29592	JOHNSON ORCHARDS	1.18	0	I, D	4/15-10/15; 1/1-12/30
	29760	BRUTOCAO VINEYARDS	2.95	158	I, N, L, E	4/15-6/30 (DD)
						11/1-6/30 (STO)
	30036	JOHNSON ORCHARDS	8.54	0	N	2/15-5/15
	30161	MORENO AND COMPANY	8.5	0	N	3/1-4/30
	30162	THOMAS, ET AL	30.0	0	N	3/1-4/30
	30163	THOMAS, ET AL	30.0	0	N	3/1-4/30
FORSYTHE CREEK	30170	THOMAS, ET AL	13.0	0	N	3/1-4/30
	30553	MILOVINA BROTHERS	0	40	I, N, R, E	11/1-5/15
	30554	MILOVINA BROTHERS	0	45	I, N, R, E	11/1-5/15
	30363	TODD	0	10	I, N	11/1-5/31
McNAB CREEK	29763	NELSON & SONS, ASSOCIATES	0	69.5	I, N, L, S	11/1-4/30
	29764	NELSON & SONS, ASSOCIATES	6.7	0	N	3/15-6/1
	29765	NELSON & SONS, ASSOCIATES	6.7	0	N	3/15-6/1
	30290	WHITE	0	17	I, N, L, D, S	11/1-4/30
DOOLEY CREEK	30015	FITZGERALD	2.99	123	I, S	4/1-6/30 (DD)
						12/1-4/30 (STO)
HOWELL CREEK	29479	RUCKER	0	5	I, N, R, S	11/1-4/30
ROBINSON CREEK	29511	HILBRETH FARMS, INC.	3.0	0	N	4/15-5/30
	29512	HILBRETH FARMS, INC.	0.41	45	I, N	5/1-6/30 (DD)
COLEMAN CREEK	29783	FITZGERALD	0	70	I, N, L	11/1-6/15
MILL CREEK	30615	BARTOLOMEI	0	45	I, N, L, R, E	10/1-5/31
HENSLEY CREEK	29908	EVANS	0	600	D	11/1-4/30
UNNAMED STREAMS TRIB. TO WEST FORK RUSSIAN RIVER	29202	M.H., C.L., & V.S. TRIONE, TRUSTEES	2.0	130	I, L, N	5/1-5/31 (DD)
	29703	M.H., C.L., & V.S. TRIONE, TRUSTEES	21.0	0	N	11/1-5/31 (STO)
	30349	LIGHT	0	8.3	I, R, F, W	3/10-5/31
UNNAMED STREAMS TRIB. TO EAST FORK RUSSIAN RIVER	30560	MOERMAN	1.04	165	I, L, N, R, F	5/1-6/1 (DD)
	30564	MOERMAN	7.0	0	N	11/1-6/1 (STO)
						3/15-5/15

NOTE: I=IRRIGATION, N=FROST PROTECTION, L=HEAT CONTROL, J=INDUSTRIAL, M=MUNICIPAL, D=DOMESTIC, R=RECREATIONAL, W=WILDLIFE, E= FIRE PROTECTION

TABLE 2

Summary of Unpermitted Applications - Sonoma County

STREAM SOURCE WATERSHED	APP. NUMBER	APPLICANT	DIRECT DIVERSION (CFS)	STORAGE DEMAND (AF)	USE	SEASON
MAINSTEM RUSSIAN RIVER	29462	RUSSEL	0.65	28	I, N, R, D, E	3/15-4/30 (DD) 11/1-4/30 (STO)
	29737	WINDSOR WATER DISTRICT	11.14	0	M	1/1-12/31
	29901	RUSSIAN RIVER COUNTY WATER DISTRICT	0.66	0	M	1/1-12/31
	30199	RIVERVIEW II HOMEOWNERS ASSOCIATION	0.04	0	I	4/1-10/31
	30391	SWEETWATER SPRINGS MUTUAL WATER CO.	0.7	0	D, N, I, S	10/15-4/15
	30397	HELMOLZ	6,000 GPD	0	I	3/15-11/15
AUSTIN CREEK	30412	FIELD STONE WINERY	0.5	0	I, D, J	1/1-12/31
	30077	CAZADERO WATER COMPANY	0.13	0	M	1/1-12/31
	30186	AUSTIN ACRES MUTUAL WATER COMPANY	9850 GPD	0	D	1/1-12/31
JENNER GULCH	30179	SONOMA COAST ASSOCIATES	0	244	I	10/15-4/15
GIRD CREEK	30259	GALEF	0	42	I, N, S, R	11/1-4/30
SAUSAL CREEK	29704	KENDALL-JACKSON WINERY	0	49	I, N, L	10/1-3/31
	29705	KENDALL-JACKSON WINERY	0	2,235*	I, N, L	10/1-5/31
	29706	KENDALL-JACKSON WINERY	0	2,235*	I, N, L	10/1-5/1
	29707	KENDALL-JACKSON WINERY	1.8	750	I, N, L	4/1-9/30 (DD)
	29708	KENDALL-JACKSON WINERY	0	49	I, N, L	10/1-5/31 (STO)
	29811	KENDALL-JACKSON WINERY	0	1,080	I, N, L	10/1-5/1
MILLER CREEK	30126	MARCHESCHI	0	11	I, N, L	10/1-3/31
	29703	KENDALL-JACKSON WINERY	0	700	I, N, L	10/1-3/31
DRY CREEK	29663	PRUETT	0	20	S, R, F, W	10/31-4/30
	30182	E & J GALLO WINERY	0	250	I, N, F	10/15-5/15
MARK WEST CREEK	29754	FOOTHILLS PROPERTY OWNERS ASSOCIATION	0	25	R, F	11/15-4/15
	29802	SELAN	0	40	I, R, F, N, W	10/1-6/30
	29858	GRIGG	0	35	I, R, F	10/15-4/30
	30181	RITCHIE	2.9	51	I, R, F, N, W	5/15-9/30 (DD) 10/15-5/15 (STO)
SANTA ROSA CREEK	30051	DEGRANGE	0	28	I, S, R, D, W	10/1-5/31
	30336	ARMSTRONG	0	10	I, R	11/1-4/30
	30429	E. R. STERN, TRUST	0	27	I, N	11/1-5/31
WINDSOR CREEK	29772	SASS	0	40	I, D	10/1-5/31
	29848	FURTH	0	65	I	10/1-5/31
	29849	FURTH	0	100	I, L, N	11/1-5/31
	29850	FURTH	0	25	I, L, N	10/1-5/31
	29862	SCHRAM	0	14	R	10/15-5/15
	30223	SONOMA CUTTER VINEYARD	0	120	I, N, L	11/1-3/31
GREEN VALLEY CREEK	29333	KEEPER	0	20	I, N	12/1-5/15
	30583	KENDALL-JACKSON WINERY	0	60	I, N	11/1-4/30

STREAM SOURCE WATERSHED	APP. NUMBER	APPLICANT	DIRECT DIVERSION (CFS)	STORAGE DEMAND (AF)	USE	SEASON
MAACAMA CREEK	29381	BERRINGER WINE ESTATES	0	30	I, N	11/1-5/15
	29715	FERRARA-CARANO VINEYARDS	0	400	I, N, L, R	10/1-3/31
	29784	BURTON	0.03	20	I, N, L, R, F	3/1-6/1 (DD)
	29983	OGG	0	26	I, N, L, J	11/1-5/31 (STO)
	29998	CARR	0	30	I, N, L, J	10/1-4/30
DUTCH BILL CREEK	29444	CAMP MEEKER RECREATION/PARK DISTRICT	0	5.7	D	11/1-6/1
	30044	CAMP MEEKER RECREATION/PARK DISTRICT	7,200 GPD	1.0	M	1/1-12/31 (DD) 8/1-12/31 (STO)
BIG SULPHUR CREEK	27177	UNION OIL COMPANY OF CALIFORNIA	22	0	J	10/1-5/1
	29201	NORTHERN CALIFORNIA POWER AGENCY	33.4	7,000	J	10/1-6/30 (DD) 10/1-6/30 (STO)
	30518	CALPINE GEYSERS COMPANY	0.4	0	J	11/1-4/30
	30540	COOK	2.3	0	I, N, L	3/15-4/30
	30541	COOK	0	400	I, N, L	11/1-5/1
CROCKER CREEK	30540	COOK	2.3	0	I, N, L	3/15-4/30
	30541	COOK	0	400	I, N, L	11/1-5/1
UNNAMED STREAMS TRIBUTARY TO RUSSIAN RIVER	30282	FERRARI-CARANO VINEYARDS	0	98	I, N	11/1-4/30
	30364	RICKARDS	0	23	I, N	11/1-4/30
	30365	RICKARDS	3	0	I, N	3/15-4/30
	30534	MINIAR	0	79	I, N, L	11/1-4/30

NOTE: I=IRRIGATION, N=FROST PROTECTION, L=HEAT CONTROL, J=INDUSTRIAL, M=MUNICIPAL, D=DOMESTIC, R=RECREATIONAL, W=WILDLIFE, E=FIRE PROTECTION

TABLE 3

Summary of Unaccepted Applications - Mendocino and Sonoma County

STREAM SOURCE WATERSHED	APP. NUMBER	APPLICANT	DIRECT DIVERSION (CFS)	STORAGE DEMAND (AF)	USE	SEASON
MAIN STEM RUSSIAN RIVER	00114	BRUTOCAC VINEYARDS	2.95	0	N	3/1-5/15
	00127	JOHNSON & DEMARCHI	6.11	0	N	3/1-6/1
	00128	KOHN PROPERTIES	2.57	0	N	3/1-6/1
	00129	KOHN PROPERTIES	8.68	0	N	3/1-6/1
	00130	KOHN PROPERTIES	40.75	0	N	3/1-6/1
	00131	KOHN PROPERTIES	29.58	0	N	3/1-6/1
	00132	KOHN PROPERTIES	8.68	0	I	6/1-10/1
	00133	KOHN PROPERTIES	2.57	0	I	6/1-10/1
	00134	KOHN PROPERTIES	5.68	98.18	I, N	6/1-10/1 (DD) 3/1-6/1 (STO)
	00135	JOHNSON & DEMARCHI	32.71	0	N	3/1-6/1
	00313	MENDOCINO COUNTY R.R. FLOOD CONTROL AND WATER CONSERVATION IMPROV. DIST.	75	15,000	I, D	1/1-12/31
	00448	CITY OF CLOVERDALE	5.57	0	M	1/1-12/31

NOTE: I=IRRIGATION, N=FROST PROTECTION, L=HEAT CONTROL, J=INDUSTRIAL, M=MUNICIPAL, D=DOMESTIC, R=RECREATIONAL, W=WILDLIFE, E=FIRE PROTECTION

3.0 HYDROLOGY

3.1 General The hydrology of the Russian River is typical of most northern California coastal streams. The river is characterized by high flows in the winter and low flows during the summer, with substantial variation in annual runoff.

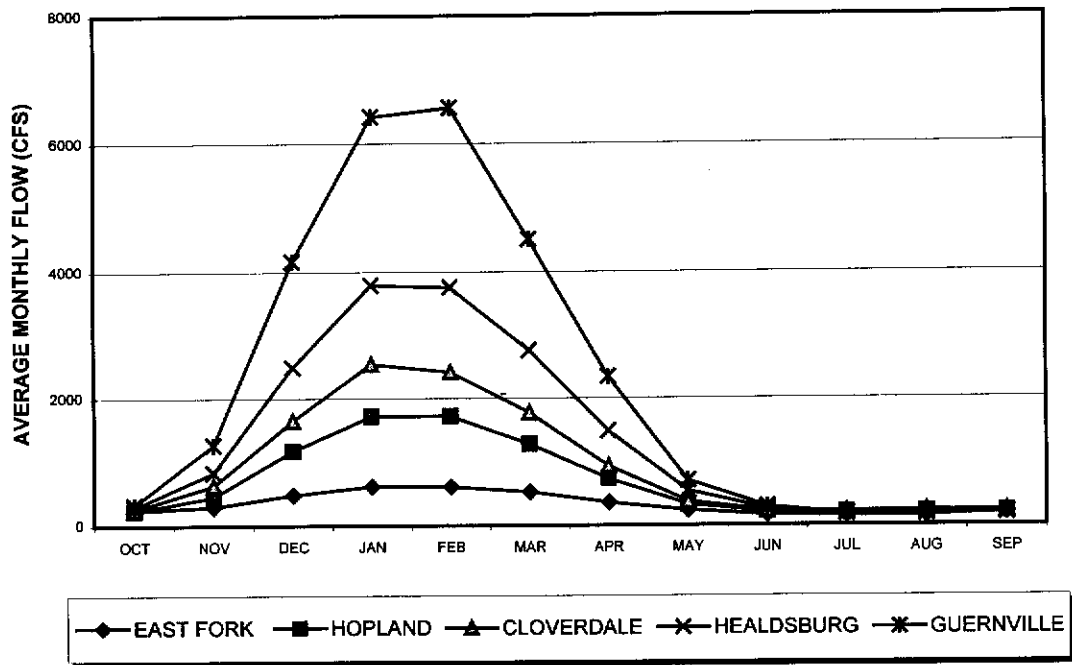
Streamflow has been measured by the U. S. Geological Survey (USGS) at five locations on the main stem of the river and at several locations on major tributaries, for various periods of time. Figure 1 shows the locations of these gages. The period of record for these gages are shown in Table 4 below:

TABLE 4
USGS Gaging Stations within the Russian River Watershed

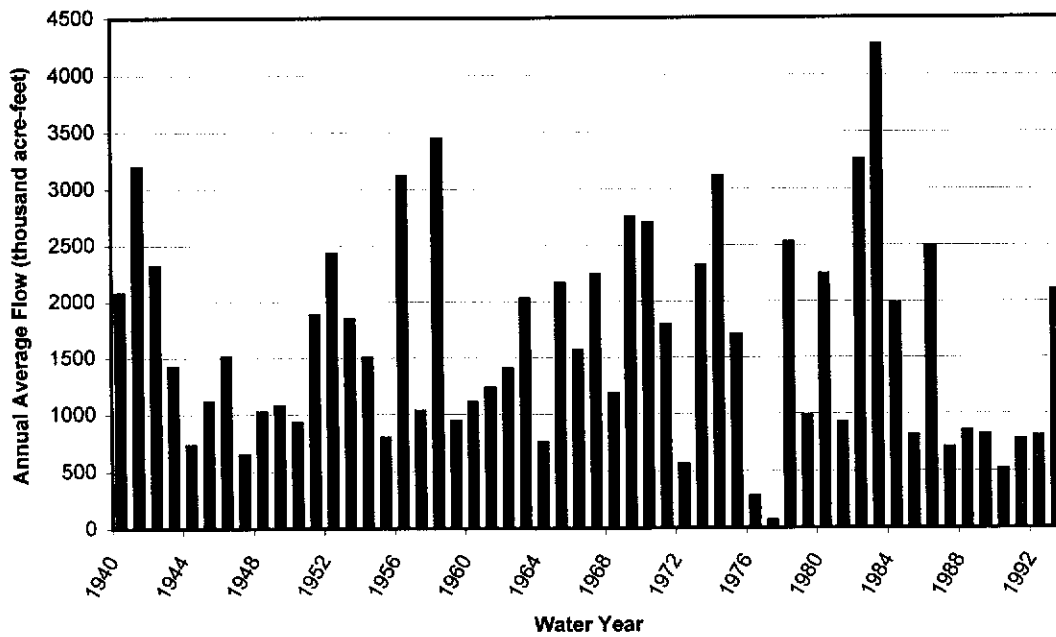
STATION	LOCATION	PERIOD OF RECORD
CAPELLA (# 11461500)	MAIN STEM RUSSIAN RIVER	1941-1996
CLOVERDALE (# 1146300)	MAIN STEM RUSSIAN RIVER	1951-1996
GUERNEVILLE (# 1146700)	MAIN STEM RUSSIAN RIVER	1939-1996
HEALDSBURG (# 1146400)	MAIN STEM RUSSIAN RIVER	1939-1996
HOPLAND (# 11462500)	MAIN STEM RUSSIAN RIVER	1939-1996
CAZADERO (# 11467200)	AUSTIN CREEK	1960-1966
KELLOG (# 11463900)	MAACAMA CREEK	1961-1981
UKIAH (# 11461000)	WEST FORK RUSSIAN RIVER	1953-1993

Figure 2 shows the average monthly flow in the Russian River, as measured at the five USGS gage locations. Figure 3 shows the annual flow in the river as measured at the Guerneville gage from 1940 to 1983. The Russian River has an average annual runoff of 1,610,000 afa; however, runoff has varied from a low of 64,000 af in 1977 to a high of 4,300,000 af in 1983. There is very little snow in the watershed; consequently, virtually all runoff is a direct result of rainfall. Approximately 95 percent of rainfall occurs from October to May.

FIGURE 2: RUSSIAN RIVER AVERAGE MONTHLY FLOW COMPARISON



**FIGURE 3: ANNUAL RUSSIAN RIVER FLOW AT GUERNEVILLE
(WATER YEAR 1940 TO 1993)**



3.2 Water Development Projects There is extensive development within the watershed that substantially affects the flow in the Russian River and tributaries.

3.2.1 Recorded Diversions In addition to the 81 pending applications, there are a total of 1,326 recorded water rights within the Russian River watershed in Mendocino and Sonoma Counties on file with the Division, including: 1,047 permitted/licensed applications, 11 Stockpond Certificates, 21 Small Domestic Use registrations, and 247 Statements of Water Diversion and Use⁸. Table 5 provides a summary of the recorded water rights. Many of these permits are for direct diversion for agricultural irrigation and frost protection; consequently, there is substantial water demand during the spring and summer season, when instream flow is critically important for coho and steelhead.

Of the 1,047 permitted/licensed applications, a total of 512 are storage projects, of which 488 are classified as minor storage project (i.e., less than 200 acre-feet capacity) and 24 are classified as major storage projects (i.e., greater than 200 acre-feet capacity). Of the 24 major storage projects, 17 fall in the range of 200 to 500 acre-feet capacity, 3 fall in the range of 500 to 1,000 acre-feet capacity, and 2 fall in the range of 1,000 to 3,000 acre-feet capacity. The remaining two major storage projects are for Lake Mendocino, with a capacity of 122,500 af, and Lake Sonoma, with a capacity of 381,000 af.

TABLE 5
Recorded Water Rights within the Russian River Watershed

CATEGORY	TOTAL NUMBER	DIRECT DIVERSION (CFS)	STORAGE (AF)
PERMITTED/LICENSED	1047	3,254	486,648
STOCKPONDS	11	0	28
SMALL DOMESTIC USE REGISTRATIONS	21	0.03	76
STATEMENTS OF WATER DIVERSION AND USE	247	1,842	3,269
CERTIFICATE OF POWER RIGHTS	4	-	-
TOTAL	1,326	5,096	529,020

⁸ Riparian and pre-1914 water users are required by statute to file a Statement of Water Diversion and Use (Statement), however, not all water users file Statements.

3.2.2 Potter Valley Project Pacific Gas and Electric Company (PG&E) operation of the Potter Valley hydro electric project results in the importation of approximately 159,000 afa into the Russian River watershed. This project was initiated in the early 1900's, when Snow Mountain Water and Power Company began diverting water from the Eel River at the Van Arsdale diversion dam, through a transmountain tunnel to the Potter Valley Powerhouse. After the water was used to generate power, the water imported from the Eel River was discharged into the East Fork Russian River. In 1922, PG&E acquired the system and subsequently constructed Scott Dam on the Eel River, creating Lake Pillsbury. In 1950, PG&E increased the capacity of the transmountain tunnel for the Eel River diversion to about 350 cfs, and entered into contractual arrangements with Potter Valley Irrigation District, whereby PG&E agreed to supply 50 cfs to the District. Any imported Eel River water in excess of contractual commitments with the District was considered as abandoned water. Consequently, this abandoned Eel River water has become the major supply of water in the Russian River during the late summer and fall.

PG&E has three water right Licenses 1424, 1199, and 5545 (Applications 1719, 5661, 6594), which authorize the diversion and rediversion of Eel River water at Scotts Dam (Lake Pillsbury) and Van Arsdale Dam into the East Fork Russian River. Table 6 summarizes PG&E's water rights.

TABLE 6

Summary of PG&E's Water Rights

WATER RIGHT	POINT OF DIVERSION	SEASON OF DIVERSION	ANNUAL AMOUNT	PLACE OF USE	AUTHORIZED USES
A-1719 L-1424	SCOTT DAM VAN ARSDALE DAM	11/1-6/1	102,366 AFA	EEL RIVER, POTTER VALLEY POWERHOUSE	POWER, FISH AND WILDLIFE
A-5661 L-1199	SCOTT DAM VAN ARSDALE DAM	11/1-4/30	4,500 AFA	POTTER VALLEY IRRIGATION DISTRICT	IRRIGATION
A-6594 L-5545	SCOTT DAM VAN ARSDALE DAM	5/1-10/15 11/1-6/1	40 CFS 4,908 (4098 AFA)	POTTER VALLEY IRRIGATION DISTRICT	IRRIGATION

The Federal Energy Regulatory Commission (FERC) has directed PG&E to evaluate modification of the Potter Valley Project to improve the condition of the fishery resources. Cal Trout has recommended that PG&E reduce the amount of water diverted from the Eel River in order to improve the conditions for fishery resources in the Eel River. There are on-going discussions involving several agencies including PG&E, FERC, DFG, Cal Trout and the Eel-Russian River Commission. Obviously, any reduction in the amount of water diverted from the Eel River would reduce the supply of water available within the Russian River watershed, particularly in the main stem.

The United States Supreme Court has determined that FERC has exclusive jurisdiction to establish fish bypass requirements on

federally licensed hydro electric projects, such as PG&E's Potter Valley Project; consequently, the SWRCB has no water right permit review authority in this matter, except as it may relate to the protection of downstream water rights. Any future modification of the Potter Valley project may require a FERC license amendment which, in turn, may require issuance of a Water Quality certificate by the SWRCB, in accordance with section 401 of the Clean Water Act. A 401 certificate may require specific terms to protect beneficial uses of water.

3.2.3 Sonoma County Water Agency The Sonoma County Water Agency (SCWA) is the largest water diverter within the watershed and has four water right permits issued by the SWRCB for operation of the Russian River Project. These permits authorize the storage of 122,500 afa in Lake Mendocino on the East Fork of the Russian River and storage of 245,000 afa in Lake Sonoma on Dry Creek. These permits also allow for the diversion and re-diversion of up to 180 cfs or 75,000 afa at Wohler-Mirabel pumping plant on the Russian River. The authorized purposes of use include municipal, domestic, irrigation, industrial and recreation. These permits authorize use of water in the SCWA service area as well as other areas outside of the Russian River watershed including the Marin Municipal Water District and the North Marin Water District.

As indicated in section 3.2.2 above, a substantial portion of the flow into the Russian River is water that is imported from the Eel River by PG&E via the Potter Valley power project.

The U.S. Corps of Engineers (Corps) also operates the Russian River Project for flood control. The Corps has flood control operating rule curves that provide minimum pools in both reservoirs. The SWRCB does not have jurisdiction to regulate the Corp's operation of the Russian River Project for flood control purposes.

In 1986 the SWRCB adopted Decision 1610 that established conditions relating to SCWA's water right permits for the operation of the Russian River Project. The decision established instream flows to be maintained by SCWA in the Russian River and Dry Creek through the coordinated operation of Lake Mendocino and Lake Sonoma. In that decision, the SWRCB also evaluated water availability and stated:

"Because of the projected shortage, we have in effect allocated the remaining available water under Permits 12947A, 12949, and 12950 first to instream environmental uses including the fishery, and then to SCWA at its diversion facilities, to the extent that downstream minimum flow requirements are met. Substantially higher minimum flows likely would cause the system to go dry in less than normal years, to the detriment of all beneficial uses dependent on it, and would in other years lower Lake Mendocino enough to impair its recreational and environmental uses and reduce its reliability as a water supply."

SCWA is currently evaluating alternatives to increase its water supply to meet future needs in its service area. The proposed project includes increased diversions from the Russian River, a conjunctive

use project, and water conservation. SCWA circulated a draft EIR⁹ for this project in September 1996. The draft EIR states that SCWA proposes to increase diversions from the Russian River by 26,000 afa, thereby increasing the total diversions from 75,000 afa to 101,000 afa. SCWA must submit an application and petitions to the SWRCB requesting approval for these changes in their water rights¹⁰.

Recently, the Division received approximately 560 letters from residents in the Russian River watershed who object to any increase in SCWA's diversion from the Russian River. The letters are virtually identical and state that the parties object to any increase in water allocation to SCWA unless a major water conservation program is implemented. The letters also request that SCWA and other major municipal users within the watershed be required to implement a plan to maximize agricultural reuse of treated wastewater.

The Marin Municipal Water District is also evaluating the possibility of increasing the amount of water that could be obtained from the Russian River under contract with SCWA. In 1995, the SWRCB adopted Order WR 95-17 that established instream flow requirements and limited the amount of water available from Lagunitas Creek in Marin County, the District's primary source of supply.

3.3 Reservation On August 17, 1961, the SWRCB, pursuant to Decision D-1030, ordered the conditional approval of water right Applications 12919A and 12920A for storage in Lake Mendocino. In D-1030, the SWRCB found that: (1) it was in the public interest to protect all water uses supplied from the Russian River main stem which existed at the time Applications 12919 and 12920 were filed in 1949, and (2) that a reservation should be made for a sufficient quantity of water to meet future requirements in Mendocino County and uses along the Russian River in Sonoma County. Accordingly, D-1030 reserved 8,000 afa for beneficial use in the service area of Mendocino County Russian River Flood Control and Water Conservation Improvement District, and 10,000 afa for beneficial use within the Russian River Valley in Sonoma County.

Attachment C provides a description of staff's evaluation of the amount of water that is available under this reservation. As described in Attachment C, staff have determined that approximately 5,000 af of Mendocino County's 8,000 af reservation is still available for appropriation and approximately 2,500 af of Sonoma County's 10,000 reservation is still available for appropriation. Staff recommends that the pending applications on the main stem of the Russian River be approved, in each county, in order of priority date of the application. These applications are for a total pending demand of 1,703 afa in Mendocino County and a pending chargeable demand of 1,713 afa in Sonoma County.

⁹ SCWA. *Draft Environmental Impact Report: Water Supply and Transmission System Project*. September 1996.

¹⁰ Ibid. Vol. IV, Appendix G.

3.4 FAS Determination Section 1205 et seq. of the Water Code provides that the SWRCB can declare a stream system to be fully appropriated. A declaration can relate to a specific stream reach and/or season. For example, the SWRCB can declare a stream to be fully appropriated during the summer. A declaration that a stream system is fully appropriated means that all available supplies of water are being used and that no water is available for appropriation within that stream reach during the specified season. In most cases, water right permits can not be issued on a fully appropriated stream. Tables 7 and 8 below provide a summary of streams and related decisions in which the SWRCB has declared certain seasons of the year to be fully appropriated within the Russian River watershed in Mendocino and Sonoma Counties.¹¹

3.5 Hydrologic Model The Division has developed a hydrologic model to estimate the average monthly unimpaired runoff for each tributary. The model provided estimated flow values that were used to determine water availability and to determine the instream flow requirements needed to protect fishery resources.

The model was developed by California State University, Sacramento under contract with SWRCB. The model is based on the HEC-1 model and also incorporates parameters that define the physical characteristics of the watershed. Basically, the model is a rainfall-runoff model, i.e. the model can be used to estimate the runoff that would occur for different rainfall amounts. Attachment A provides a description of the model.

As described in Attachment A, a copy of the model can be obtained from the Division for a cost of \$25.

3.6 Analysis of Measured Flow Data Division staff evaluated the average monthly measured (or impaired) flow for each tributary. Division staff also calculated the exceedence curves to determine the percentage of time that different flows would occur within the stream. (For illustration, the 10 percent exceedence curve represents a 1 in 10 year frequency; i.e., in 90 percent the years, flows would be greater than that amount.) Figure 4 is a representative exceedence curve of the average annual unimpaired flow for Maacama Creek. Figure 5 is a representative curve showing the average monthly impaired and unimpaired flow in Maacama Creek. The two hydrographs are similar; however, the impaired flow is less than the unimpaired flow.

Division staff also evaluated the average daily flow in each tributary with USGS gage data. Figure 6 is a representative example showing the flow in the West Fork of the Russian River Creek for a dry water year (1954). The rainfall is also shown on Figure 6. As indicated on this figure, the streamflow increases immediately after a rainstorm. This rainfall-runoff pattern results in "spikes" or "pulses" in streamflow. As indicated on these figures, early rains are absorbed into the soil and do not result in a significant amount of runoff.

¹¹ Water Right Order 89-25, Exhibit A.

TABLE 7

Fully Appropriated Streams - Mendocino County

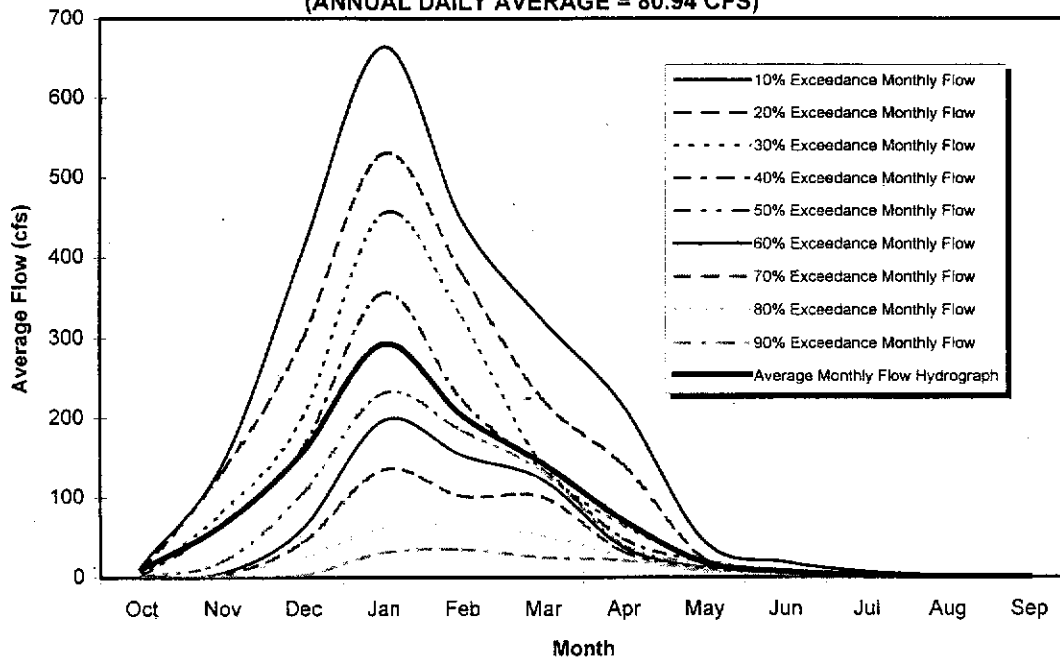
MENDOCINO COUNTY STREAM SYSTEM	RELATED DECISION or ORDER	FULLY APPROPRIATED SEASON	CRITICAL REACH
RUSSIAN RIVER (TRIBUTARY TO PACIFIC OCEAN)	D-1110 D-1610 WR 74-30	07/01 - 10/31	At the point where the boundary of the service area of the Mendocino County Russian River Flood Control and Water Conservation District crosses the Russian River, which is located a short distance north of the Mendocino/Sonoma County line upstream; excluding all tributaries with the exception of (1) the West Fork Russian River and (2) the Easy Fork Russian River excluding Potter Valley (refer to Order WR 74-30). This restriction on the main stem Russian River does not apply to uses commenced prior to January 28, 1949.
ROBINSON CREEK (TRIBUTARY TO RUSSIAN RIVER)	D-1516	07/01 - 10/31	FROM CONFLUENCE WITH RUSSIAN RIVER UPSTREAM
FELIZ CREEK (TRIBUTARY TO RUSSIAN RIVER)	D-1545	08/01 - 10/31	FROM CONFLUENCE WITH RUSSIAN RIVER UPSTREAM

TABLE 8

Fully Appropriated Streams - Sonoma County

SONOMA COUNTY STREAM SYSTEM	RELATED DECISION or ORDER	FULLY APPROPRIATED SEASON	CRITICAL REACH
MARK WEST CREEK (TRIBUTARY TO RUSSIAN RIVER)	D-0302	05/01 - 10/31	MARK WEST CREEK WHERE IT CROSSES HIGHWAY 101 LOCATED IN SECTION 29, T8N, R8W, MDB&M UPSTREAM
GREEN VALLEY CREEK (TRIBUTARY TO RUSSIAN RIVER)	D-0663	06/15 - 10/31	FROM POINT OF DIVERSION DOWNSTREAM APPROXIMATELY 6 MILES
ATASCADERO CREEK (TRIBUTARY TO GREEN VALLEY CREEK)	D-0709	06/15 - 10/31	FROM THE CONFLUENCE OF GREEN VALLEY CREEK UPSTREAM
LAGUNA DE SANTA ROSA CREEK (TRIBUTARY TO MARK WEST CREEK)	D-0852 D-0691	06/01 - 10/31	FROM LAGUNA DE SANTA ROSA AND NORTH OF MOLINO ROAD LOCATED WITHIN SECTION 26, T7N, R9W, UPSTREAM
SANTA ROSA CREEK (TRIBUTARY TO LAGUNA DE SANTA ROSA)	D-1038	06/01 - 10/31	FROM SANTA ROSA CREEK LOCATED AT THE POINT WITHIN SECTION 18, T7N, R8W, UPSTREAM
UNNAMED STREAM SW1/4, SW1/4 SEC5, T9N, R8W (TRIBUTARY TO RUSSIAN RIVER)	D-1537	06/01 - 10/31	FROM THE POINT OF DIVERSION IMMEDIATELY DOWNSTREAM AND UPSTREAM
UNNAMED STREAM SE1/4, SE1/4, SEC36, T11N, R10W (TRIBUTARY TO GILL CREEK)	D-1608	06/01 - 09/30	FROM THE CONFLUENCE OF GILL CREEK AND THE UNNAMED STREAM LOCATED WITHIN PROJECTED SECTION 1, T10N, R10W, UPSTREAM

**FIGURE 4: MONTHLY EXCEEDANCE CURVES BASED ON USGS OBSERVED DATA
COLLECTED FROM MAACAMA CREEK ABOVE KELLOGG DURING 1961 TO 1981
(ANNUAL DAILY AVERAGE = 80.94 CFS)**



**FIGURE 5: FLOW COMPARISON IN MAACAMA CREEK WATERSHED
(AVERAGE CONDITION)**

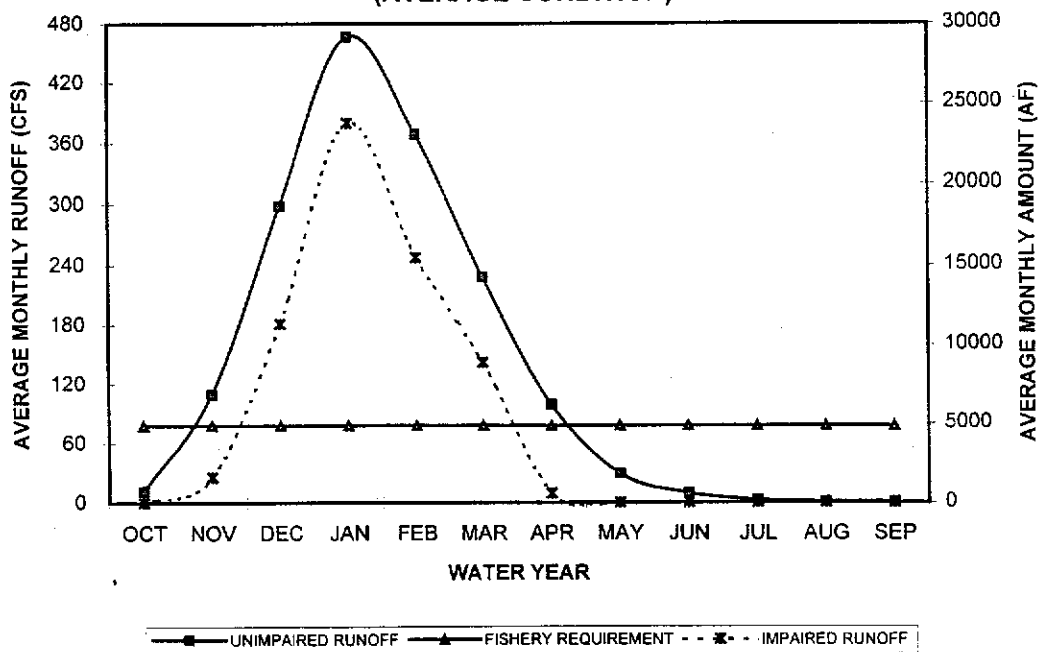
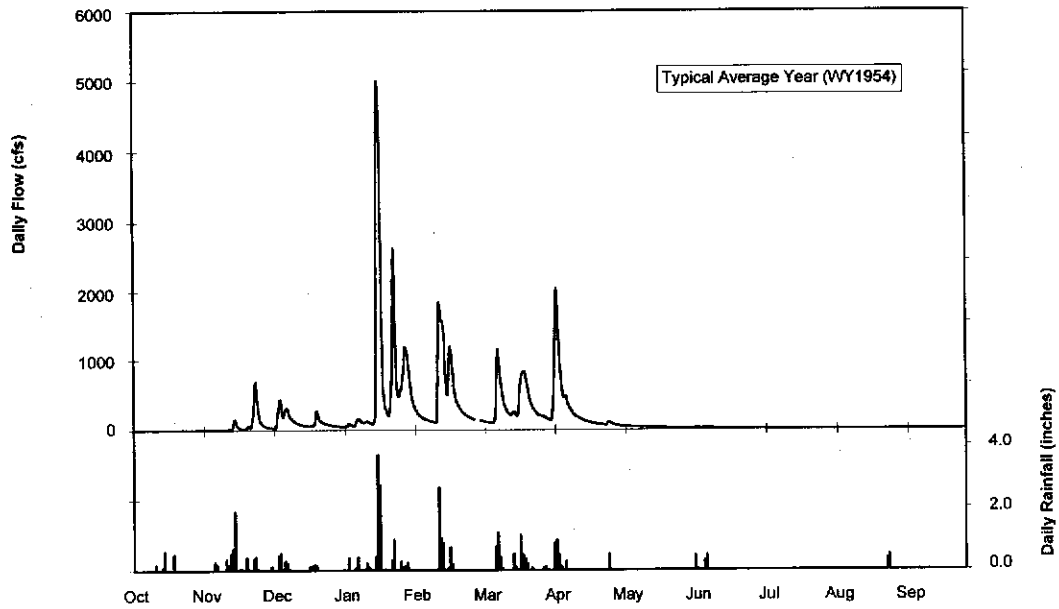
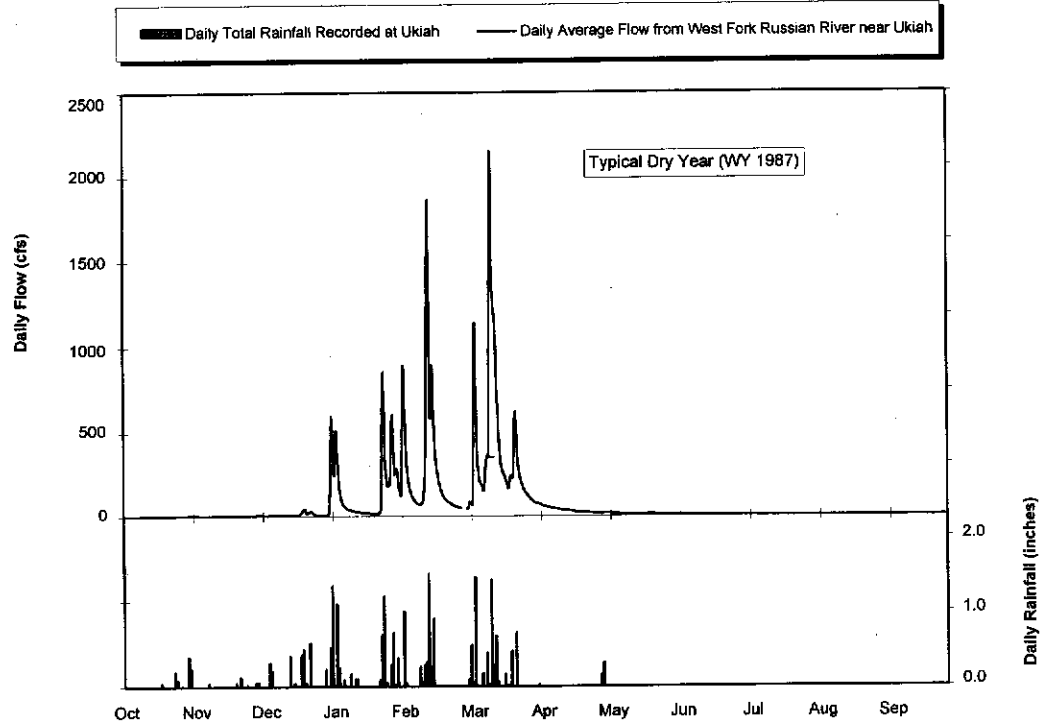


FIGURE 6: OBSERVED FLOW AND RAINFALL NEAR UKIAH



4.0 FISHERY RESOURCES

4.1 General Division staff have conducted an analysis of the measures needed to protect fishery resources within the Russian River watershed. The principal focus of this analysis is define the flow regime needed in the tributaries to protect coho and steelhead. Attachment B provides a detailed discussion of the fishery resources, the factors affecting fishery resources, and the methodology used by Division staff to develop the proposed measures to protect coho and steelhead.

The overall condition of fishery resources depends on the proper combination of several factors, including flow, temperature, dissolved oxygen, water quality, substrate conditions, availability of cover and riparian habitat. No comprehensive study has been conducted to define the flow regime needed to protect coho and steelhead within the main stem of the Russian River, or most tributaries. Limited data are available to evaluate the relationship between streamflow and the condition of the fishery resources during different life stages. Division staff have developed a recommended minimum flow regime based on consultation with DFG and other fishery agencies, a review of the literature, and a review of fishery studies conducted on two streams within the Russian River watershed and two other streams in the vicinity of the Russian River.

4.2 Population Trends The populations of coho and steelhead in the Russian River have declined dramatically. At the turn of the century, the Russian River supported a commercial salmon fishery. In the 1940's the estimated statewide population of coho ranged from 200,000 to 1,000,000. By the 1980's the estimated statewide population had declined to 33,500. The estimated coho population in the Russian River has declined from 7,000 in 1975 to less than 1,000 in the 1990's. The historic steelhead population was estimated at over 400,000 fish. Currently, the estimated statewide steelhead population is 39,000. Within the Russian River watershed, the estimated steelhead population in the 1880's ranged from 20,000 to 60,000. Currently, the estimated population ranges from 10,000 to 20,000 including hatchery fish.

As described in Attachment B, numerous factors have contributed to the decline of the fish populations including water development projects, gravel mining operations, land use practices, timber management practices, barriers to fish passage, and degradation of water quality. Control of many of these activities is outside of the jurisdiction of the SWRCB. As described in Section 1.5 above, however, several agencies and environmental organizations are conducting studies and/or completing activities that are designed to restore the anadromous fishery resources within the watershed.

4.3 Life Stages Coho and steelhead are anadromous fish. Both species are born and live in fresh water, migrate to the ocean, and then return to their stream of birth to spawn and repeat the life cycle. Although the species are similar, the life stages for the two species occur during different time periods. Figure 7 below shows the time periods for the different life stages.

COHO SALMON	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
UPSTREAM MIGRATION												
SPAWNING												
INCUBATION												
EMIGRATION/REARING												
REARING												
STEELHEAD	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
UPSTREAM MIGRATION												
SPAWNING												
INCUBATION												
EMIGRATION/REARING												
REARING												

Figure 7: Life Stages for Coho and Steelhead

4.4 Proposed Flow Regime The following provides a discussion of the proposed flow regime required in the tributaries for during different seasons and different life stages of coho and steelhead.

4.4.1 Fall Coho and steelhead arrive at the mouth of the Russian River in the late summer and fall and then migrate upstream when storms increase the flow in the river. Storms in the fall provide "pulse" flows that serve as an "environmental cue" that causes the fish to migrate upstream. These pulse flows also increase the flow in the tributaries which allows for the physical passage of fish and provides adequate areas for spawning. Consequently, the pulse flows are particularly important to the upstream migration and spawning of coho. As described in Attachment B, staff reviewed precipitation data and flow data for the main stem and tributaries. In many years, there is relatively little precipitation and few pulse flows before mid-December; however, in 90 percent of all years of record, substantial precipitation and pulse flows occur by mid-December. Accordingly, staff recommend that no new diversion be allowed before December 15 in order to avoid reduction in the pulse flows in the tributaries and the main stem of the Russian River.

4.4.2 Winter Coho migrate upstream from October through January and spawn from November through the end of January, with incubation of embryos extending through March. Steelhead begin upstream migration in November, with spawning occurring from January through April, and incubation extending through May.

Adequate flow is required for successful spawning. In addition, it is important that adequate flow be maintained throughout the incubation period to prevent dewatering of redds and to prevent an increase in temperature and a reduction in dissolved oxygen levels. Usually steelhead require higher flows than coho in order to achieve optimum spawning conditions. Consequently, the instream flow required for steelhead spawning is the limiting factor during this time period.

Staff recommend that a minimum winter spawning flow be established that is equivalent to 60 percent of the average annual unimpaired flow. As described in Attachment B, this value is based on comparison of the average annual flow and results of the IFIM studies (i.e. Instream Flow Incremental Methodology) conducted on two streams within the Russian River watershed and two other streams in the immediate vicinity. In addition, the proposed spawning flows are based on a review of other SWRCB decisions that relied on the results of IFIM studies to establish flows to keep fish in "good" condition.

High pulse flows are also important for gravel recruitment, i.e., moving gravel downstream and removing silt from gravel in order to provide suitable habitat for spawning. In order to preserve these pulse flows, staff recommend that all new permits include a term that would limit the allowable rate of diversion. The maximum allowable rate of diversion could be limited (for example, a maximum of 2 cfs) or could be set as a percentage of the flow in the stream, i.e. a higher rate of diversion would be allowed on larger streams with higher flows. Staff recommend that specific permit terms be developed on a case-by-case basis in conjunction with the review of each application.

4.4.3 Spring During the spring (March through April) coho incubation and out-migration are occurring. Steelhead spawning, incubation and out-migration are also occurring during this time period.

Although streamflow diminishes naturally during the spring, it is important that adequate flow be maintained, particularly for incubation and out-migration. A reduction in flow could dewater redds, could cause a harmful increase in temperature and dissolved oxygen levels, and could diminish flows necessary for the physical passage of out-migrating fish. Consequently, staff recommend that the spawning bypass flow extend through April. However, water is not available on a reliable basis in April to provide these flows. In most years, such flows are available only to the end of March. Therefore, to prevent any further reduction in spring flows, staff recommend that no new diversions be allowed after March 31.

4.4.4 Summer Adequate flow in the tributaries for rearing of coho and steelhead is the limiting factor during the summer months. Review of hydrologic data indicates that most tributaries have relatively low flow, particularly in the late summer. Low flows can result in

elevated temperatures and reduced dissolved oxygen levels which can be lethal to coho and steelhead.

As described in Attachment B, staff compared the average annual flow to the results of IFIM studies, as well as other SWRCB decisions and determined that a minimum flow equal to 30 percent of the average annual flow is required during the summer to keep rearing habitat in good condition. Review of hydrologic data indicates that this minimum flow is rarely achieved. Accordingly, staff recommend that no new diversions be allowed from the tributaries during the summer.

4.4.5 Summary Figure 8 shows the recommended minimum flow regime and allowable season of diversion, in relation to the daily unimpaired flow. As indicated, diversion would only be allowed from December 15 to March 31, provided that a bypass flow equal to 60 percent of the average annual unimpaired flow is maintained in the stream during that period. It should be emphasized that these proposed measures are general recommendations that would apply primarily to relatively small projects located on tributary streams. Additional terms may need to be developed on a case-by-case basis for larger projects.

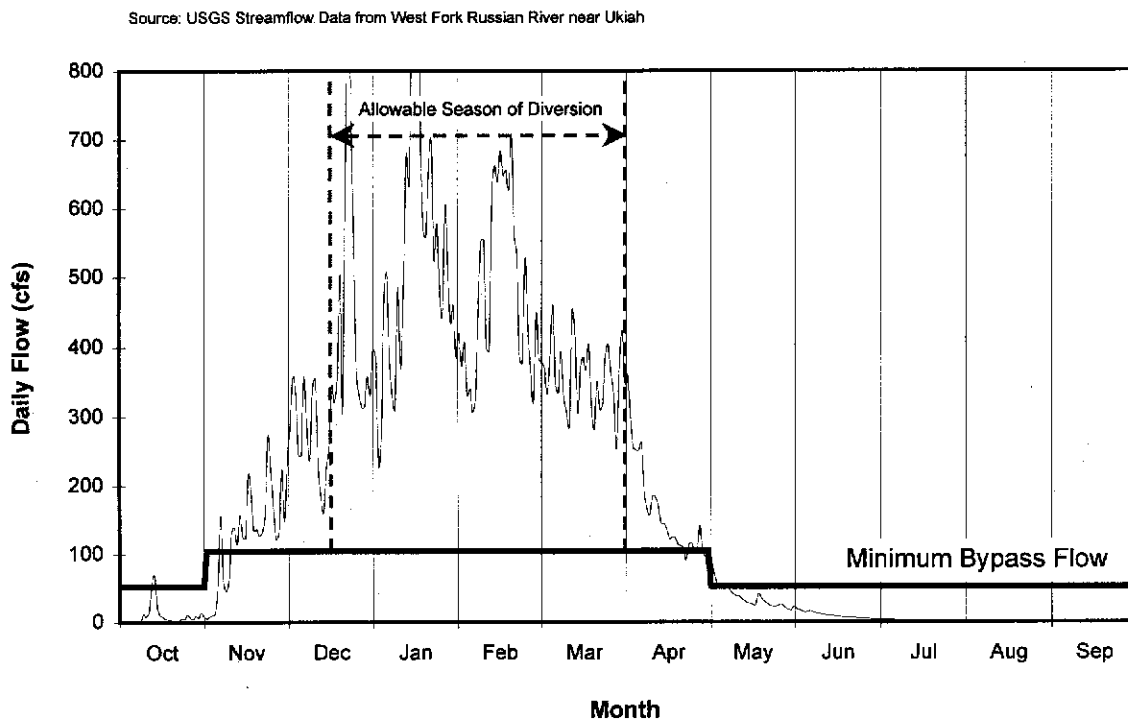


FIGURE 8

Recommended Minimum Flow Regime and Allowable Diversion Season

4.5 Fishery Resources in the Main Stem In general, the main stem of the river does not provide good habitat for spawning and rearing of coho and steelhead. In particular, conditions in the lower portion of the river have been adversely affected due to a combination high water temperatures, gravel mining operations, "downcutting" of the stream channel, loss of riparian habitat and degradation of water quality. These conditions have resulted in a proliferation of warm water fish that are predators of coho and steelhead.

SCWA is required to maintain instream flow requirements in the main stem of the Russian River as required by D-1610. That decision established instream flows for different seasons and different water year types (normal, dry, critically dry), based on the total inflow to Lake Pillsbury, on specified dates. The existing instream flow requirements do not provide the optimum habitat for anadromous fishery resources. Rather, D-1610 states that the flow standards are based on balancing of beneficial uses of water and environmental risks. In that balancing, the SWRCB considered SCWA's need for water, instream flows needed for fishery resources, recreation, aesthetics, riparian vegetation, dilution of wastewater discharges, recreational benefits at the lakes and economics. Despite significant adverse environment impacts, the SWRCB approved the project after making a finding of overriding considerations under CEQA.

The main stem of the Russian River provides for the upstream and downstream migration of coho and steelhead. The pulse flows in the fall are particularly important for upstream migration. As described in Attachment B, however staff have concluded that approval of all pending applications would have no measurable effect on the pulse flows in the main stem.

Since the SCWA is required to maintain instream flows in the main stem of the Russian River, approval of all pending applications would have no measurable effect on the summer flow in the main stem. However, approval of applications on the main stem could result in increased diversions from Lake Mendocino and/or Lake Sonoma which, in turn, could deplete the amount of cold water stored in the lakes. This could result in an increase in water temperature, both in the lakes and downstream, which could have an adverse impact to fishery resources¹².

4.6 Barriers to Fish Migration There are numerous barriers to the migration of anadromous fishery located throughout the watershed. For example, Lake Sonoma blocks passage to about 130 square miles of area above the dam, or 11% of the total watershed; Lake Mendocino blocks passage to about 105 square miles of area above the dam, or 7% of the total watershed¹³. Several agencies are currently evaluating methods to remove barriers to fish migration. For example, DFG is currently circulating an EIR relating to the construction of a fish ladder on the

¹² SCWA EIR, Vol. I, pg. 6.4-3

¹³ SCWA. The Russian River: An Assessment of its Condition and Governmental Oversight. August 1996. (Pages 1-VI-2 and 3)

Healdsburg dam; studies are in progress relating to providing fish passage facilities in the Matanzas Creek culvert in the City of Santa Rosa.

In general, staff recommend that no application be approved that would create a new barrier to fish migration. Staff recommend that all new reservoirs either be constructed off-stream or, if constructed on-stream, provide a fish ladder that conforms to criteria acceptable to DFG and NMFS. Staff recommend approval of applications for on-stream reservoirs that are constructed above permanent barriers to fish migration, for example, applications located in the Dry Creek watershed upstream of Lake Sonoma. On-stream reservoirs may be approved on a case-by-case basis if the reservoir is located on a stream that does not provide habitat suitable for coho or steelhead.

4.7 Fish Screens Improperly screened diversion facilities can adversely affect coho and steelhead. Young fish can be drawn into the diversion facilities or can be impinged on the screens. Staff recommend that new permits include terms that would require construction of fish screens that conform to criteria developed by DFG and NMFS.

5.0 EVALUATION OF WATER AVAILABILITY

5.1 General The SWRCB is required to act on the pending water right applications. When acting on these applications, the SWRCB must comply with numerous provisions of the law. The SWRCB is required to maximize the beneficial uses of water resources of the state, to protect public trust resources, to ensure that diversion and use of water is reasonable and in the public interest, and to develop terms to mitigate adverse environmental impacts whenever feasible.

In order to maximize the beneficial uses of water, the SWRCB must balance competing uses of water. In this particular case, the SWRCB must balance the benefits of off-stream consumptive uses of water and the need for instream flow to protect anadromous fish and other public trust resources. On the one hand, the pending applications would authorize the diversion and use of water for municipal, domestic and agricultural uses, which are important to the public interest and the economy of Mendocino and Sonoma counties. On the other hand, providing adequate instream flow is important for the protection and enhancement of coho and steelhead, particularly during low-flow conditions in the tributaries. The practical effect of the Endangered Species Act is that the SWRCB must place emphasis on those measures needed to protect coho and steelhead.

The SWRCB must also determine that water is available for appropriation in accordance with section 1375 of the Water Code, taking into account existing diversions, prior SWRCB decisions and flows needed for the protection of fishery resources. The following provides an evaluation of water availability and the measures needed to protect fishery resources for several categories of projects.

5.2 Wintertime Storage Projects Staff have evaluated water availability within the tributaries based on a review of actual flow data and theoretical flow data developed by the hydrologic model and the proposed minimum fish bypass requirements described in Section 4.4 above. Figures 9, 10, and 11 are representative examples of water availability for average and dry water year conditions for three tributaries; Austin Creek, Maacama Creek, and West Fork Russian River. These tributaries are located near the mouth of the Russian River, near the middle of the watershed, and at the headwaters; consequently, these tributaries should provide a good cross-section of water availability conditions throughout the entire watershed. These figures show the actual flow that occurred in an average water year and a dry water year, with 1 in 10 year frequency. It is important to note that the actual flow data take into account existing diversions of water. The amount of water available for appropriation in average and dry years in these three watersheds is summarized in Table 9 below.

**FIGURE 9: WATER AVAILABILITY AND FISH FLOW REQUIREMENTS IN AUSTIN CREEK
NEAR CAZADERO FOR AVERAGE AND DRY YEAR CONDITIONS**

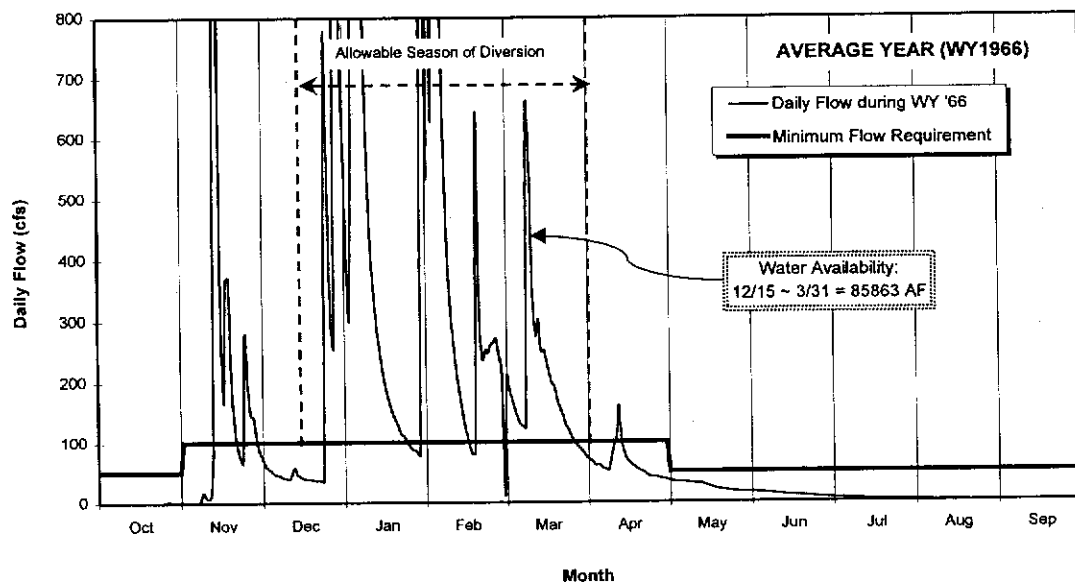
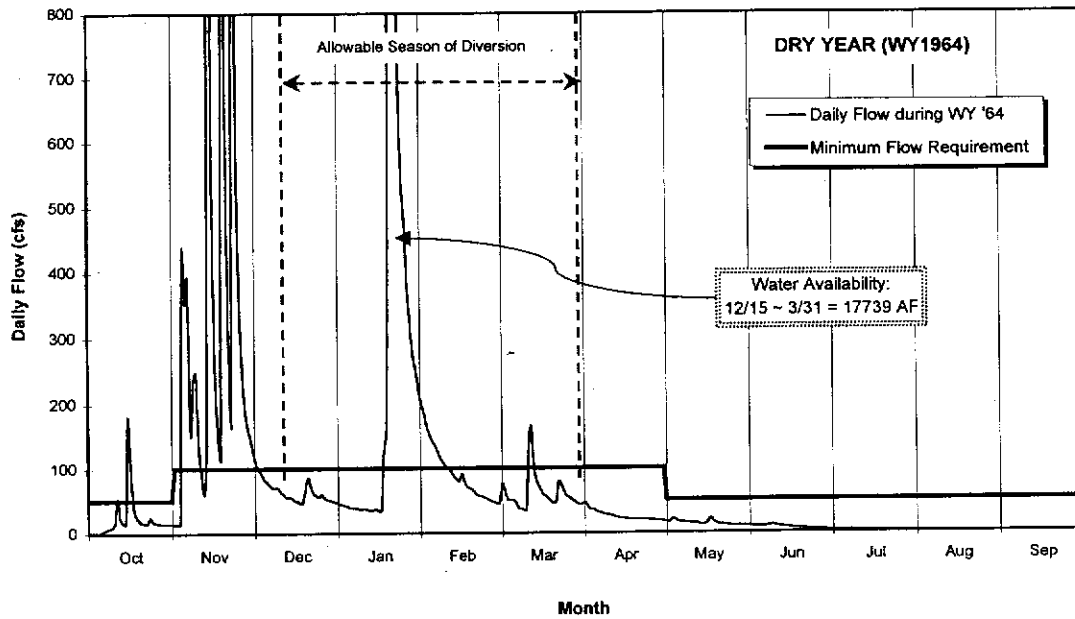


FIGURE 10: WATER AVAILABILITY AND FISH FLOW REQUIREMENTS IN MAACAMA CREEK ABOVE KELLOGG FOR AVERAGE AND DRY YEAR CONDITIONS

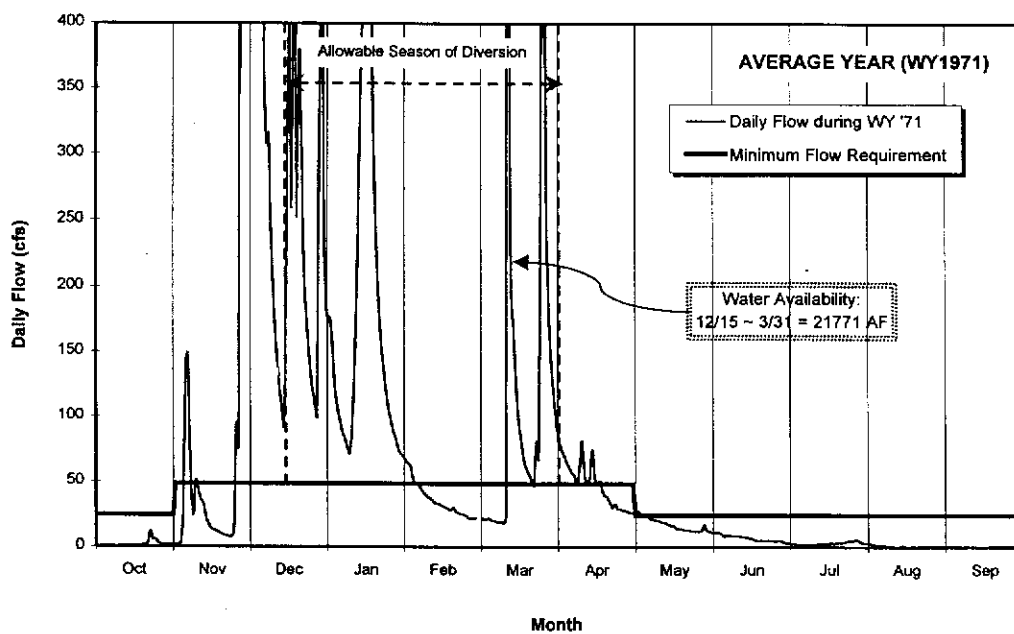
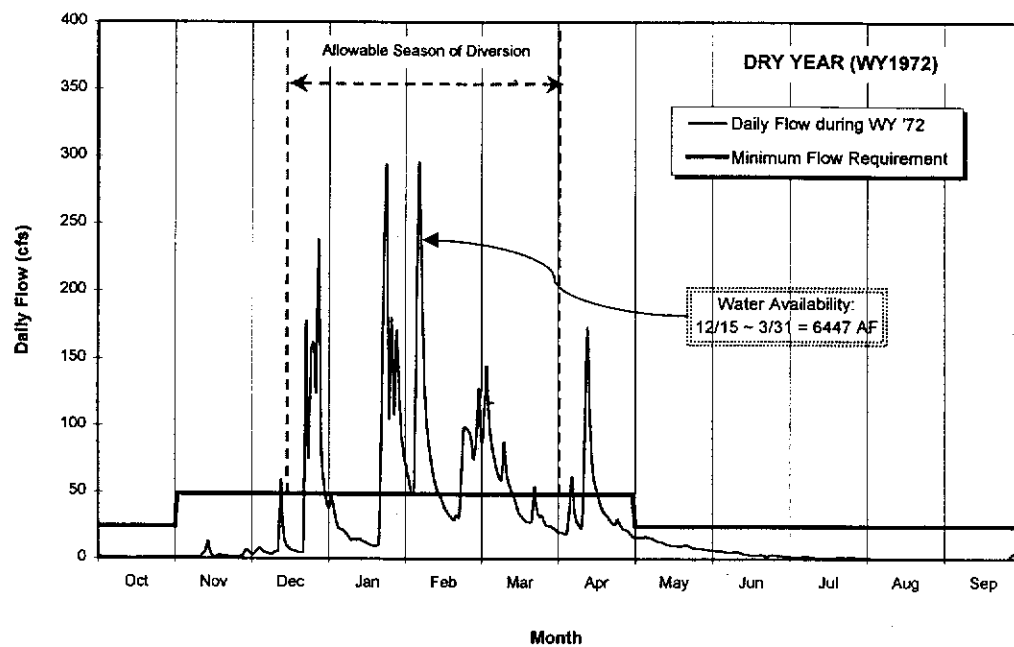


FIGURE 11: WATER AVAILABILITY AND FISH FLOW REQUIREMENTS IN WEST FORK RUSSIAN RIVER NEAR UKIAH FOR AVERAGE AND DRY YEAR CONDITIONS

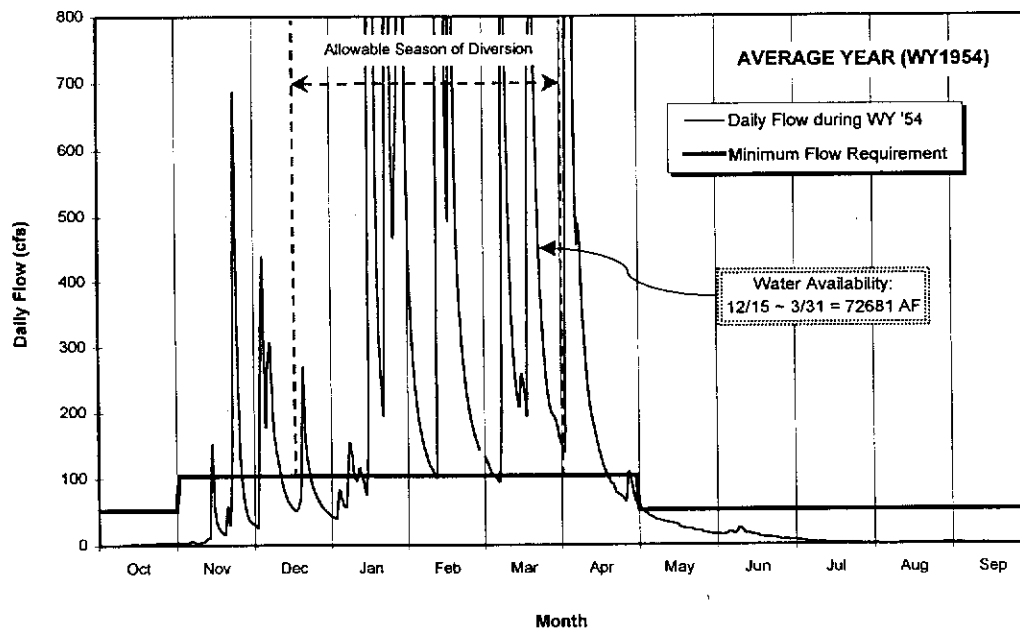
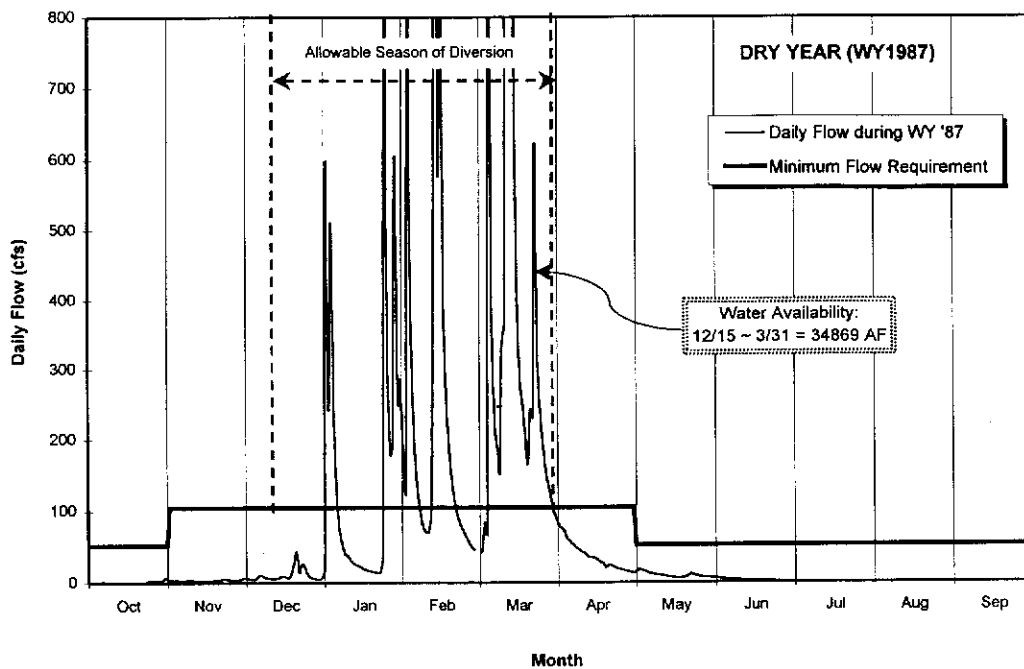


TABLE 9

**Water Available for Appropriation in Average and Dry Year Conditions
in Austin Creek, Maacama Creek and the West Fork of the Russian River**

WATERSHED	WATER AVAILABLE (AFA) AVERAGE CONDITION	WATER AVAILABLE (AFA) DRY CONDITION
AUSTIN CREEK	85,863	17,739
MAACAMA CREEK	21,771	6,447
WEST FORK RUSSIAN RIVER	72,681	34,869

As indicated in Table 8, water is available for appropriation during peak winter runoff periods in both average and dry year conditions. Accordingly, Division staff recommend approval of pending applications seeking water right permits for wintertime storage and diversion of water, with the inclusion of the following conditions that are designed to protect the fishery resources within the Russian River watershed.

Allowable Season of Diversion The diversion season would be limited to December 15 to March 31. This would prevent diversions during the fall to avoid impacts to upstream migration and spawning, and during the spring to avoid impacts to spawning, incubation and outmigration.

Minimum Bypass Flow New permits would require a minimum bypass flow of 60 percent of average annual flow in order to provide adequate flow for upstream migration, spawning, incubation and out-migration.

Barriers to Fish Passage Staff recommend that applications for storage projects be approved only when the reservoir would not create a barrier to migration of anadromous fish. Staff recommend approval of applications only if the reservoir is constructed off-stream, or provides a fish ladder, or is constructed upstream of an existing permanent barrier to fish passage, or is located on a stream that does not provide habitat suitable for coho or steelhead.

Maximum Rate of Diversion New permits would include terms that would limit the maximum allowable rate of diversion. Limiting the rate of diversion would preserve "pulse" flows which are important for attraction and upstream migration of fish and for gravel recruitment, which is important to providing suitable spawning habitat. The allowable rate of diversion would be determined on a case-by-case basis, depending on the flow in the stream.

Fish Screens New permits would include terms that would require the installation of fish screens that conform to criteria developed by DFG and NMFS.

Bypass Facilities New permits would require that all on-stream reservoirs include bypass facilities that would allow bypass of flows, consistent with the terms described above.

Compliance New permits would contain specific measures to demonstrate compliance with the terms described above. Those measures would be developed on a case-by-case basis

5.3 Spring Frost Protection There are 11 applications within tributary watersheds requesting water rights for direct diversion for frost protection from March through May. Diversions of water for frost protection present a difficult problem. The period from March through May is a critical season for frost protection; however, maintaining adequate flow in the stream is also important for several critical life-stages of coho and steelhead. If all diverters simultaneously divert water for frost protection, flows could be lowered dramatically and impact fish. In order to evaluate the reasonableness of direct diversion for frost protection, Division staff have evaluated alternative methods that could be used to provide frost protection.

The SWRCB was faced with a similar situation on the Napa River. In that particular case, the SWRCB determined in 1972 that direct diversion for frost protection, when the river contained insufficient flow to supply all needs, represented an unreasonable method of diversion and use of water. The SWRCB restricted diversions from the Napa River for frost protection purposes, and required diverters to participate in a trial distribution program controlled by a watermaster. Sections 659 and 660 were added to the Regulations to define SWRCB policy for diversion of water from the Napa River for frost protection. In March 1974, legal action was brought in the Superior Court of Napa County by the SWRCB against diverters who were in violation of SWRCB policy. The lawsuit was ultimately settled by a stipulated judgement which required the diverters to participate in the trial distribution program.

A publication prepared by the Cooperative Extension at the University of California at Davis (Leaflet #2743) discusses frost protection measures for vineyards in Napa, Sonoma and Mendocino counties. The report presents comparative cost data for the two principal methods used for frost protection -- wind machines and sprinklers. The report states that the total annual costs of the two methods are:

	<u>Cost per acre</u>
. Wind machines and heaters	\$220 to 230
. Sprinklers	\$190 to 200

These data indicate that using wind machines, rather than directly diverting water from streams, is more expensive but is a reasonable, cost-effective, alternative method for providing frost protection. As described in the SWRCB memo on reasonableness "The overriding public interest may require an individual to incur reasonable additional expense in order to maximize beneficial uses of water."

The Cooperative Extension report also discusses the requirements for construction of small reservoirs to provide for winter time storage of water that could then be used to supply water for frost protection in the spring. The report states that a reservoir with a capacity of 22 af would provide sufficient capacity to provide frost protection for a 40 acre vineyard for a total of 60 hours of frost conditions. The total area required for the reservoir would depend on the topography of the

site and the depth of the reservoir. The report indicates that a 22 af reservoir would require about three acres of land.

The report also discusses the cost and practicality of using wells to provide water for frost protection.

As indicated above, there are reasonable, cost-effective alternative methods of providing frost protection, other than further direct diversions from the streams. As discussed in Attachment B, there are limited data available to define the flow regime in the spring to protect the fishery resources, however, providing adequate flow during this period is important for several life-stage of coho and steelhead. Consequently, staff concludes that new diversions for frost protection represent an unreasonable method of diversion and use of water. Accordingly, staff recommend that new diversions not be allowed after March 31, unless the applicant submits specific studies which demonstrate that further diversions in the spring will have no significant effect on coho and steelhead.

If applicants wish to construct off-stream storage reservoirs for storage of water for frost protection, rather than requesting a water right for direct diversion of water, it may be necessary for parties to submit a new application. Those new applications would have lower priorities than the pending applications. Where allowed, the Division will modify the applications for direct diversion and issue permits for off-stream storage reservoirs.

5.4 Projects on Main Stem Water is available for appropriation under D-1030 reservations for Mendocino and Sonoma Counties. Staff recommends the conditional approval of these pending applications, provided that existing protests can be resolved. Approval of the pending applications will have immeasurable impact on the flow in the main stem of the Russian River.

5.5 Municipal There is one pending application that requests a water right for existing diversion from the underflow of Austin Creek to supply 53.59 afa of water for municipal purposes in the town of Cazadero, which has about 280 permanent residents and 350 vacation residents. There is one other pending application that requests a water right for existing diversion from the underflow of Austin Creek to supply 10 afa for domestic purposes at 25 homes. There may be overriding public interest considerations that would preclude the SWRCB from canceling these applications. In both cases, the SWRCB is the "lead" agency and must prepare an environmental document. Staff will conduct an evaluation to determine whether there are feasible alternatives to the existing diversions and/or whether measures can be developed that would mitigate the potential impacts to fishery resources resulting from these diversions.

5.6 Domestic Several applications request the right to store 10 af or less of water for domestic purposes. Section 1228 et seq. of the Water Code provides for the issuance of Small Domestic Registration certificate for domestic use not exceeding direct diversion of 4,500 gpd or diversion by storage of 10 afa. For pending applications that meet these criteria, staff proposes to issue Small Domestic Registration certificates.

6.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1 Proposed Actions on Pending Applications The SWRCB is required to act on pending applications and to balance competing beneficial uses of water. To accomplish those objectives, Division staff developed a hydrologic model, developed terms to protect coho and steelhead, reviewed existing SWRCB decisions and evaluated water availability. Based on a review of that information, staff recommend that the pending applications be processed in accordance with the general guidelines described in this staff report.

Staff will contact protestants to determine whether the measures described in this staff report will satisfy concerns raised in the protests and whether the protestants are willing to withdraw their protests. If the protests are resolved and/or withdrawn, staff would process the permits. If protests are not withdrawn, staff would conduct a field investigation and prepare a staff analysis and/or would hold a hearing in accordance with section 1345 et seq. of the Water Code.

In conjunction with that review process, Division staff will conduct a site-specific environmental assessment of each project and prepare the appropriate environmental document, when the Division is the lead agency. Staff may propose additional measures to mitigate potential impacts to public trust resources other than coho and steelhead.

On those pending projects with no unresolved protests, staff will prepare the appropriate environmental document and issue the permits, in accordance with the conditions described above.

Staff will continue processing the 12 incomplete/unaccepted applications. Following receipt of necessary information, staff will distribute a notice to interested parties and will process those applications as described above.

6.2 Fully Appropriated Stream This report provides an analysis of water availability, as required by section 1375 of the Water Code and provides sufficient basis for the SWRCB to declare the entire watershed to be a fully appropriated stream. Accordingly, staff recommend that all tributaries within the entire Russian River watershed be added to the list of Fully Appropriated Streams (FAS) from April 1 through December 14.

Section 1205 (c) of the Water Code allows modification of the FAS designation, upon petition of any party and the conduct of a hearing by the SWRCB. To request a future change in the FAS designation, parties would be required to submit detailed hydrologic data to show that water is available for appropriation, including the results of specific studies relating to the instream flow needed to protect coho and steelhead.

It should also be noted that any new permit would include standard water right permit 12. This term provides for the reserved jurisdiction of the SWRCB to modify terms relating to the public trust resources. The SWRCB could modify the terms proposed in this staff report, following submittal of specific information and a water right hearing.

6.3 SCWA Applications/Petitions SCWA has indicated that it will submit an application and petitions requesting modification of its water right permits. The application and petitions would relate to SCWA's operation of Lake Sonoma and instream flow in Dry Creek and the lower portion of the Russian River. SCWA is currently completing an EIR relating to those changes. Staff recommend that, in conjunction with review of SCWA's application and petitions, the SWRCB review the instream flow requirements for the entire main stem of the Russian River. In conjunction with the review of SCWA's water rights, the SWRCB could review the results of other on-going studies that are currently being conducted by other agencies.

6.4 Coordination Staff will continue to coordinate with other agencies that are conducting studies leading to the development of comprehensive plans for the Russian River watershed.

ATTACHMENT A
DESCRIPTION OF HYDROLOGIC MODEL

ATTACHMENT A **DESCRIPTION OF THE** **STREAMFLOW SIMULATION MODEL**

1.0 INTRODUCTION

The purpose of this attachment is to describe the hydrologic model that was developed to determine the streamflow within the Russian River watershed. The hydrologic model, referred to as the Streamflow Simulation Model or SSM, was developed for the Division by the Civil Engineering Department at California State University Sacramento. The primary purpose of the model is to develop weekly average unimpaired hydrographs in the ungaged tributaries, or subbasins, within the watershed. The streamflow data produced by the SSM model can then be used to determine the amount of water available for appropriation within each subbasin. In addition, the results produced by the SSM model can be used to develop instream fish bypass flow requirements.

A copy of the model, on a 3½" floppy (MS Windows based), can be obtained from the Division of Water Rights at a cost of \$25 by contacting Andy Chu at (916) 657-1015.

2.0 GENERAL DESCRIPTION OF THE SSM MODEL

The HEC-1 computer program, developed by the Corps of Engineers, forms the basic core of the Streamflow Simulation Model. Although the HEC-1 program is referred as flood hydrograph package, the program is designed to simulate the surface runoff response due to various precipitations including low and average storm events. The low and average flow hydrographs are essential for an evaluation of water availability and a determination of fish flow requirement within the Russian River watershed. Since the HEC-1 is a rainfall-to-runoff program, it can be used to predict streamflow based on precipitation within the basin. This concept is essential to defining streamflow, since there are no streamflow gages in many of the tributaries. The HEC-1 program has the capability to simulate flow based on different time intervals such as hourly, daily, or weekly. The SSM model was developed to generate average weekly flow data. Based on the generated weekly flow data, the SSM model can also estimate average bi-weekly, monthly or annual flow.

In many respects, the SSM is an enhancement of the HEC-1 program. The SSM uses the capabilities of the HEC-1 program to model the Russian River watershed. The principal enhancements relate to the method used to develop the unit hydrograph, the method used to develop the base flow, and the method used to input precipitation data.

3.0 MODEL ELEMENTS

There are five main input parameters to the HEC-1 model:

- . Unit hydrograph
- . Base flow
- . Precipitation
- . Soil classification
- . Physical characteristics of the subbasin

The following provides a brief description of these parameters and procedures used to develop values for these parameters.

3.1 Unit Hydrograph The unit hydrograph defines the relationship between a one-inch storm event and direct runoff. The unit hydrograph was determined using the Unit Hydrograph Interface Program (or UHG), developed by Peter Weller a retired hydrologist formerly with the U.S. Corps of Engineers. According to Mr. Weller's recommendations, the Los Angeles Valley S-Curve was used to run the UHG program.

The unit hydrograph was determined on a subbasin basis. The following parameters that define the physical characteristics of the subbasin were used as input parameters in the UHG program to determine the unit hydrograph:

- Basin area
- Distance to centroid of the subbasin
- Distance to the most remote point in the subbasin
- Slope (or difference in elevation) in the subbasin

These physical characteristics are illustrated on Figure 1. The values for each of these parameters were calculated for each subbasin using U.S. Geological Survey topographic maps. These data were then entered into the UHG program to generate the unit hydrograph for each subbasin.

3.2 Base Flow Estimation The direct runoff is the excess flow resulting from a specific storm event. As illustrated in Figure 2 below, the HEC-1 divides streamflow into two components -- base flow and direct runoff.

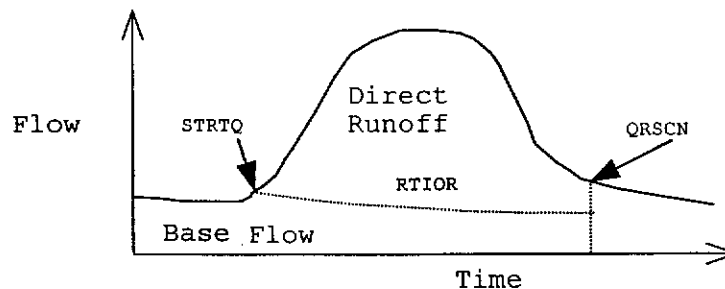


Figure 2: Base Flow Parameters Used in HEC-1

As shown on Figure 2, there are several parameters that are used in the HEC-1 program to define the base flow:

- STRTQ: The starting flow
- RTIOR: The exponential decay rate or the ratio of recession flow to the flow that occurs one hour later.
- QRSCN: The flow that occurs one hour after the starting flow (STRTQ) or the flow computes from the ratio of peak flow.

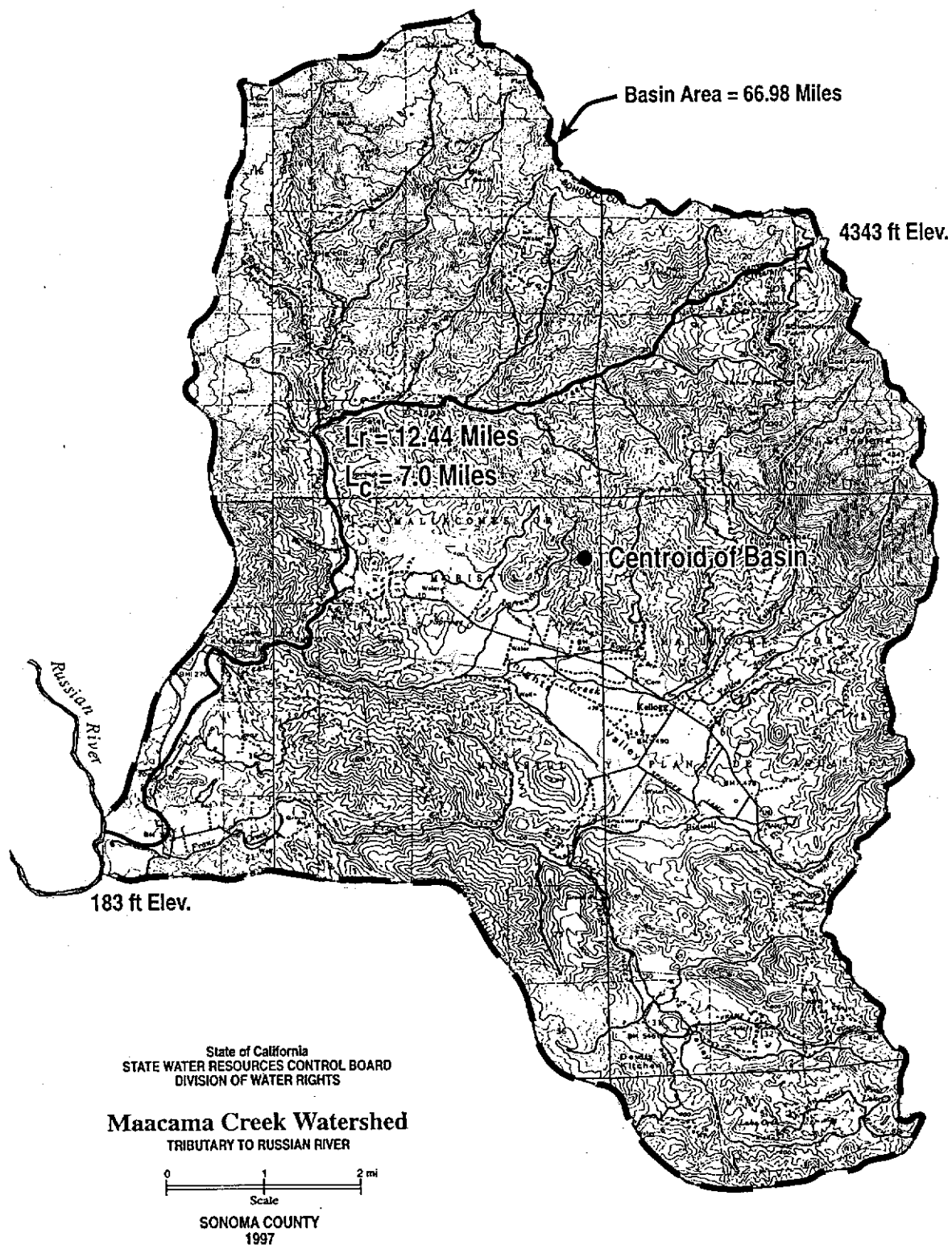


Figure 1: Typical Physical Characteristic in a Watershed

In the SSM model, the starting flow (STRTO) at the beginning of each week was derived initially from the streamflow record for the known subbasin using the graphical separation technique proposed by White and Sloto in USGS Technical Report 90-4160. The estimated starting base flow for the known basin was then adjusted using a computerized calibration process. The calibrated weekly estimated starting base flow was then adjusted for the difference in subbasin areas using the basin area ratio. The resulting base flow for each week is entered into the HEC-1 to simulate the weekly runoff for ungaged subbasins.

Two other factors, RTIOR and QRCSN, were set to default value of 1.0 for RTIOR (indicating that the decay rate is a flat line without any slope) and -0.1 for QRCSN (indicating that the recession flow is 10% of peak flow).

3.3 Precipitation Since the SSM model predicts streamflow based on rainfall, rainfall data is an important parameter in the SSM model. There is substantial variation in rainfall throughout the basin with an average of approximately 60 inches per year in the upper end of the basin and an average of approximately 40 inches per year in the lower end of the basin.

Figure 3 is an isohyetal map that shows the average annual precipitation throughout the watershed. The isohyetal map was developed using the SURFER software program and data from 110 precipitation gages located within Mendocino and Sonoma Counties.

There are five US Weather Service (USWS) rain gages at the locations shown on Figure 3. These gages have long-term rainfall data with at least a 25-year period of record. Average weekly rainfall from these stations was used as input data to the SSM model.

When calculating the precipitation within a given subbasin, the weekly rainfall data from the closest USWS gage were used. These rainfall data were adjusted based on a proration of mean annual precipitation at the USWS gage compared to the mean annual precipitation at the subbasin as shown on isohyetal map. Table 1 shows the total weekly rainfall for a 7-day period that was used in the SSM model.

3.4 Soil Complex Number The SSM model uses the Soil Complex Number (CN) values developed by the Natural Resources Conservation Service (formerly Soil Conservation Service) and soil classification based on soil maps prepared for Mendocino and Sonoma counties.

The Soil Conservation Service has developed an empirical method that uses soil properties to estimate the direct runoff from a given storm event. This procedure calculates a soil complex (or curve) number, CN, based on soil properties, land use and antecedent moisture conditions. Table 2 shows the soil classification.

When calculating the runoff using the SSM model, a composite CN number was developed for the area under consideration.

Figure 3: Five Rainfall Stations in Russian River Watershed and Isohyetal Contours Generated by SURFER

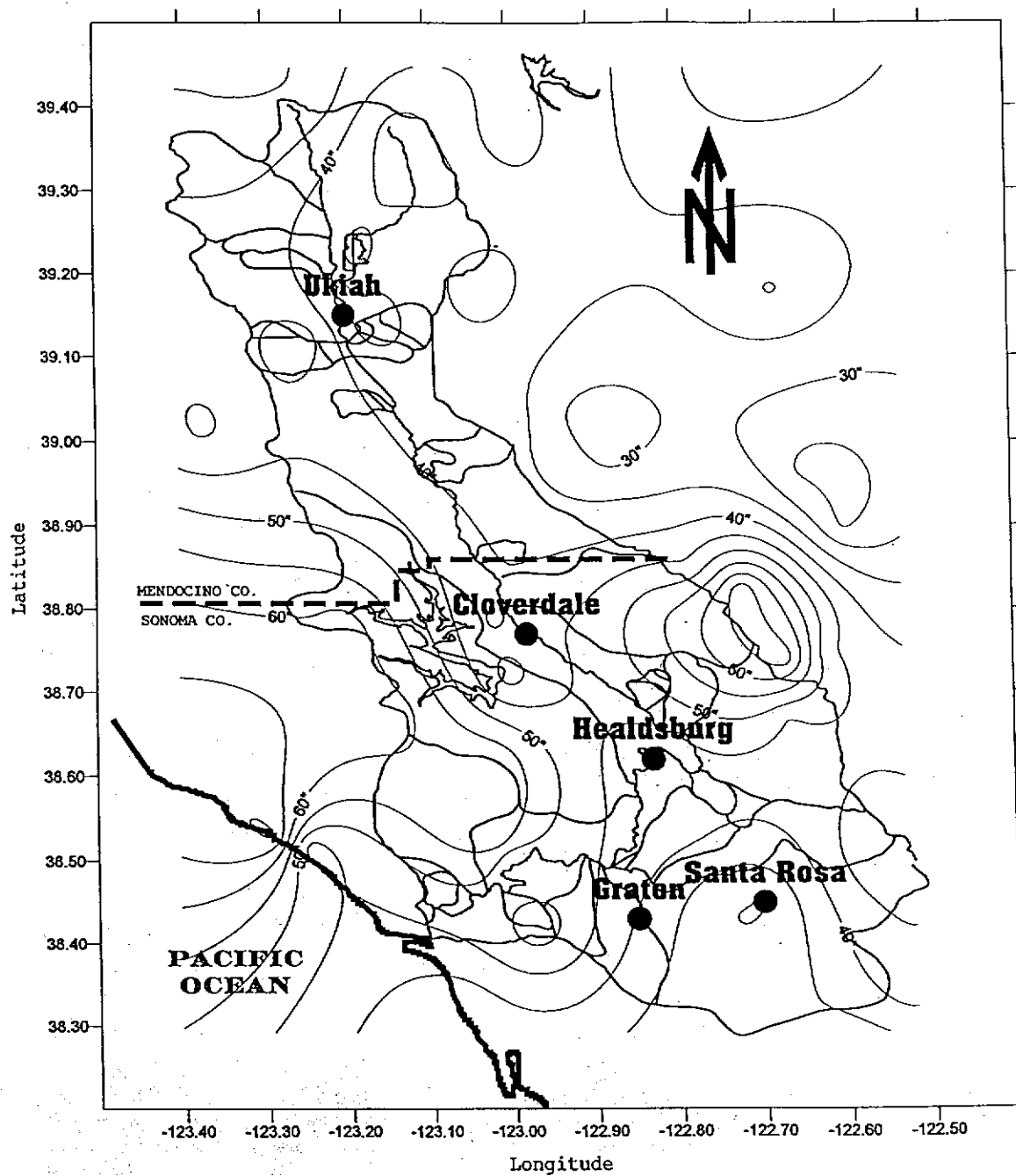


Table 1: Total Weekly Rainfall for Five Reference Stations
in the Russian River Watershed

Station	Cloverdale ('50-'91)	Graton ('48-'92)	Santa Rosa ('31-'92)	Ukiah ('08-'92)	Healdsburg ('31-'92)
Oct-01	0.16	0.18	0.13	0.27	0.20
Oct-08	0.94	0.75	0.52	0.43	0.64
Oct-15	0.41	0.35	0.25	0.30	0.31
Oct-22	0.90	0.71	0.51	0.59	0.72
Oct-29	0.70	0.70	0.67	0.66	0.81
Nov-05	1.40	1.23	0.81	1.01	1.11
Nov-12	2.05	1.96	1.26	1.41	1.81
Nov-19	1.46	1.38	0.82	1.14	1.28
Nov-26	1.51	1.55	1.03	1.36	1.46
Dec-03	1.55	1.77	1.08	1.44	1.49
Dec-10	1.26	1.08	0.84	1.38	1.25
Dec-17	2.53	2.09	1.53	1.76	2.23
Dec-24	1.47	1.57	1.35	1.57	1.88
Dec-31	1.51	1.49	1.10	1.47	1.56
Jan-07	2.40	2.13	1.44	1.71	2.16
Jan-14	2.18	2.46	1.44	2.10	2.01
Jan-21	2.12	1.94	1.37	1.70	1.91
Jan-28	1.69	1.55	1.24	1.73	1.83
Feb-04	1.75	1.77	1.26	1.59	1.83
Feb-11	2.48	2.25	1.60	1.72	2.29
Feb-18	1.53	1.49	0.86	1.40	1.31
Feb-25	1.86	1.16	1.09	1.21	1.44
Mar-03	1.47	1.36	0.94	1.05	1.28
Mar-10	1.58	1.46	1.14	1.06	1.55
Mar-17	0.97	1.16	0.83	1.06	1.02
Mar-24	1.05	0.98	0.88	1.08	1.09
Mar-31	0.92	0.75	0.69	0.82	0.86
Apr-07	0.62	0.54	0.47	0.56	0.57
Apr-14	0.62	0.52	0.37	0.39	0.50
Apr-21	0.60	0.72	0.45	0.45	0.61
Apr-28	0.19	0.31	0.31	0.30	0.33
May-05	0.24	0.16	0.13	0.20	0.16
May-12	0.14	0.09	0.12	0.18	0.16
May-19	0.16	0.11	0.15	0.24	0.17
May-26	0.13	0.12	0.17	0.17	0.20
Jun-02	0.12	0.14	0.13	0.15	0.17
Jun-09	0.06	0.03	0.06	0.09	0.07
Jun-16	0.00	0.00	0.02	0.03	0.01
Jun-23	0.00	0.05	0.04	0.05	0.05
Jun-30	0.00	0.00	0.00	0.02	0.00
Jul-07	0.04	0.05	0.03	0.01	0.03
Jul-14	0.01	0.01	0.00	0.00	0.00
Jul-21	0.00	0.01	0.00	0.01	0.01
Jul-28	0.00	0.01	0.00	0.01	0.00
Aug-04	0.02	0.00	0.00	0.00	0.01
Aug-11	0.03	0.03	0.02	0.02	0.02
Aug-18	0.09	0.04	0.05	0.03	0.04
Aug-25	0.03	0.09	0.03	0.03	0.08
Sep-01	0.04	0.02	0.01	0.06	0.01
Sep-08	0.08	0.07	0.05	0.08	0.06
Sep-15	0.31	0.25	0.18	0.16	0.20
Sep-22	0.33	0.20	0.13	0.19	0.18
Total	43.75	40.82	29.63	36.42	40.97

Table 2: Recommended CN Values and Antecedent Moisture Conditions

Land Use Description	Hydrologic Soil Group			
	A	B	C	D
Cultivated Land: without conservation treatment	72	81	88	91
with conservation treatment	62	71	78	81
Pasture or range land: poor condition	68	79	86	89
good condition	39	61	74	80
Meadows: good condition	30	58	71	78
Wood or forest land: thin stand, poor cover, no mulch	45	66	77	83
good cover	25	55	70	77
Average for less populated region	48.7	67.3	77.7	82.7
Open Spaces, lawns, parks, golf courses, cemeteries, etc.				
good condition: grass cover on 75% or more of the area	39	61	74	80
fair condition: grass cover on 50% to 75% of the area	49	69	79	84
Commercial and business areas (85% impervious)	89	92	94	95
Industrial districts (72% impervious)	81	88	91	93
Residential:				
Average lot size Average % impervious				
1/8 - 1 acre 65 - 20	60	74	82.6	86.8
Paved Parking lots, roofs, driveways, etc.	98	98	98	98
Streets and roads:				
paved with curbs and storm sewers, gravel, and dirt	82	88.	91.	92.7
Average for more populated region	59.93	74.38	82.42	86.32

(Source: *Modern Sewer Design* by American Iron and Steel Institute, page 68)

Recommended CN Values for Selected Agricultural and Suburban Land Use (Antecedent Moisture Condition II):

CN for Condition	Corresponding CN for Condition	
II	I	III
90	78	98
80	63	94
70	51	87
60	40	79
Average case	Lowest runoff potential	Highest runoff potential

4.0 CALIBRATION OF THE SSM MODEL

The SSM model was calibrated by comparing the measured flow at the Ukiah and Cloverdale gages to the theoretical streamflow produced by the SSM model for these two subbasins. Figure 4 shows the locations of these subbasins. The theoretical values produced by the SSM model were then adjusted to "fit" the measured values by modifying the base flow.

4.1 West Fork Russian River The Ukiah gage located near the mouth of the West Fork Russian River was selected as a "control" basin because of the length of records for streamflow and precipitation data. There are 40 years of USGS streamflow data (1953 to 1993) and 87 consecutive years of USWS precipitation data (1906 to 1992). In addition, there is relatively little development in the basin; consequently, the measured USGS streamflow data should provide an accurate measure of unimpaired streamflow.

4.2 Dry Creek near Cloverdale The Cloverdale gage located in the Dry Creek subbasin was selected as another "control" basin because of the length of records for streamflow and precipitation data. There are 39 consecutive years of USGS streamflow data (1942 to 1980) and 37 consecutive years of USWS precipitation data (1955 to 1991). In addition, there is relatively little development in the basin prior of 1980; consequently, the measured USGS streamflow data should provide an accurate measure of unimpaired streamflow.

5.0 MODEL VERIFICATION

The validity of the SSM model was verified by comparing the theoretical streamflow to the measured streamflow in two subbasins with recorded USGS streamflow data. Figure 4 shows the locations of these subbasins.

Staff used the SSM model to calculate the theoretical streamflow in each subbasin and compared the theoretical flow to the average measured USGS flow. Figures 5 and 6 compare the measured and theoretical flows in each of these two basins. The following briefly discusses the results in each subbasin.

5.1 Maacaama Creek The USGS gage located near Kellogg has an area of 43.4 square miles and 21 years of streamflow data (1961 to 1981). Review of Division records indicates that there are relatively few water rights above the USGS gage. The SSM model run for the Macaama Creek gage used the available streamflow data and rainfall based on the Healdsburg rain gage. Because there is relatively little diversion upstream of the USGS gage, the measured flow data should produce results that are comparable to the unimpaired flow.

5.2 Big Sulphur Creek Figure 6 compares the theoretical and measured flow data in the Big Sulphur Creek. The USGS gages measures flow from a 85.76 square mile area and have 36 years of streamflow data (1957 to 1992). The measured streamflow may be significantly affected by the operation of an upstream power plant; consequently, the measured flow data may not provide an accurate representation of the unimpaired flow.

Figure 5: Verification between Observed and Simulated Flows
for Maacama Creek above Kellogg

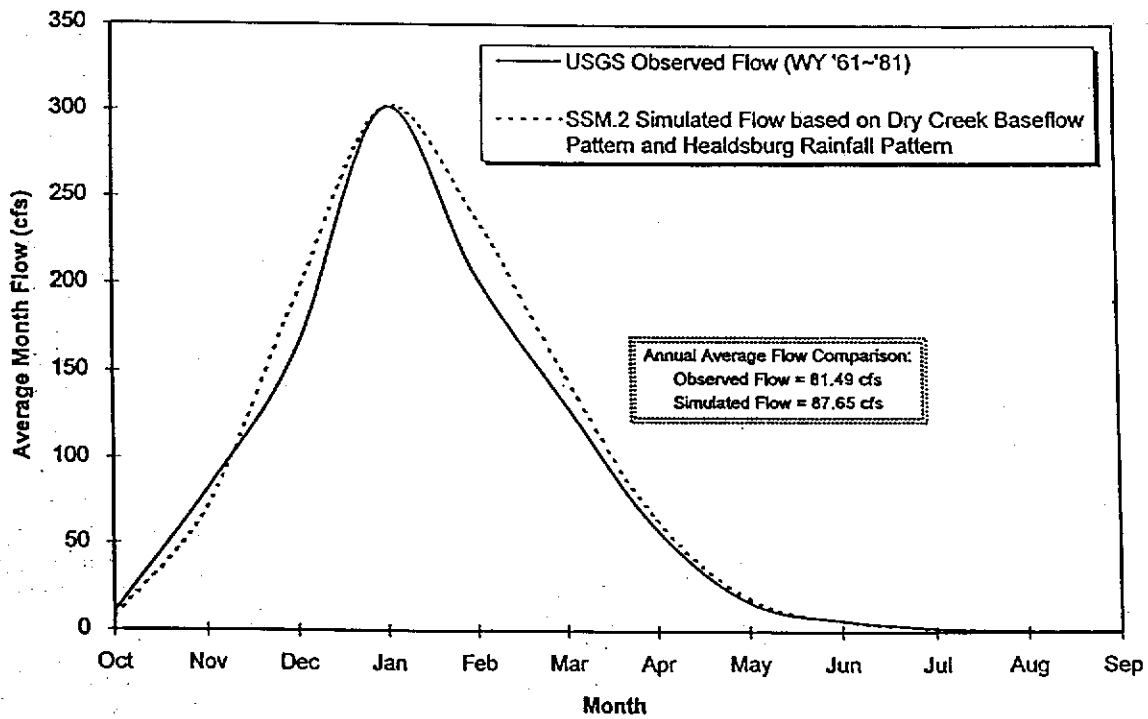
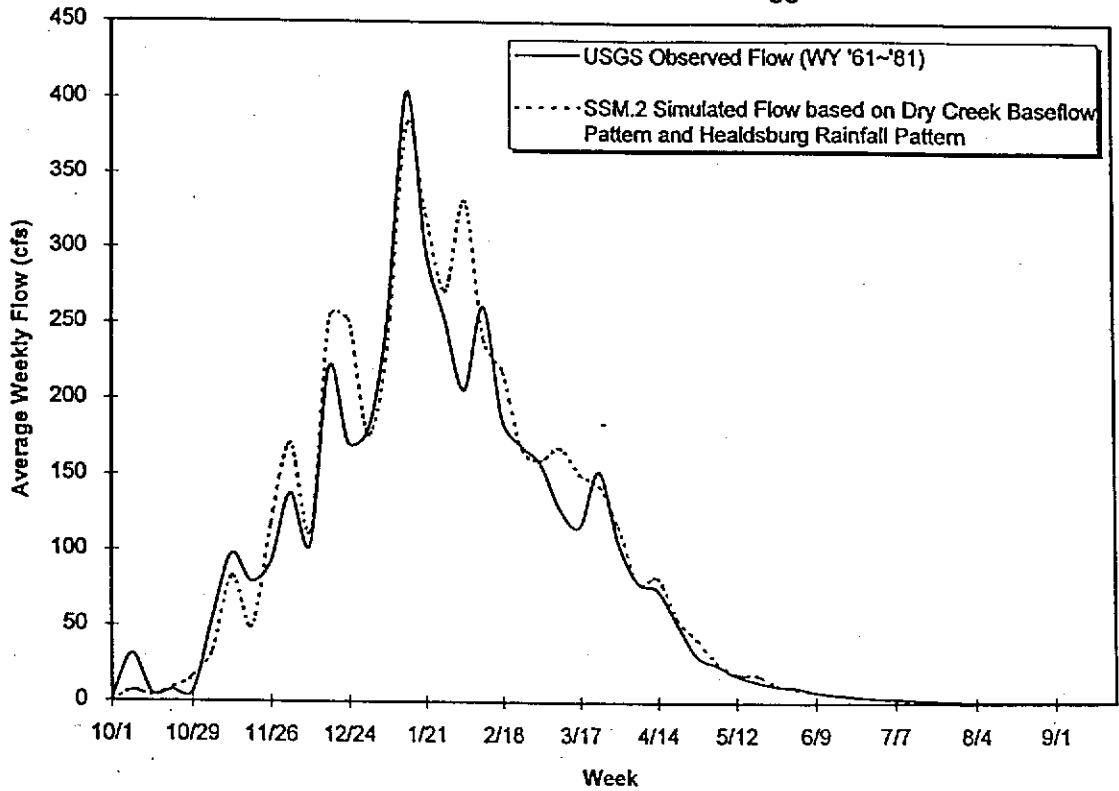
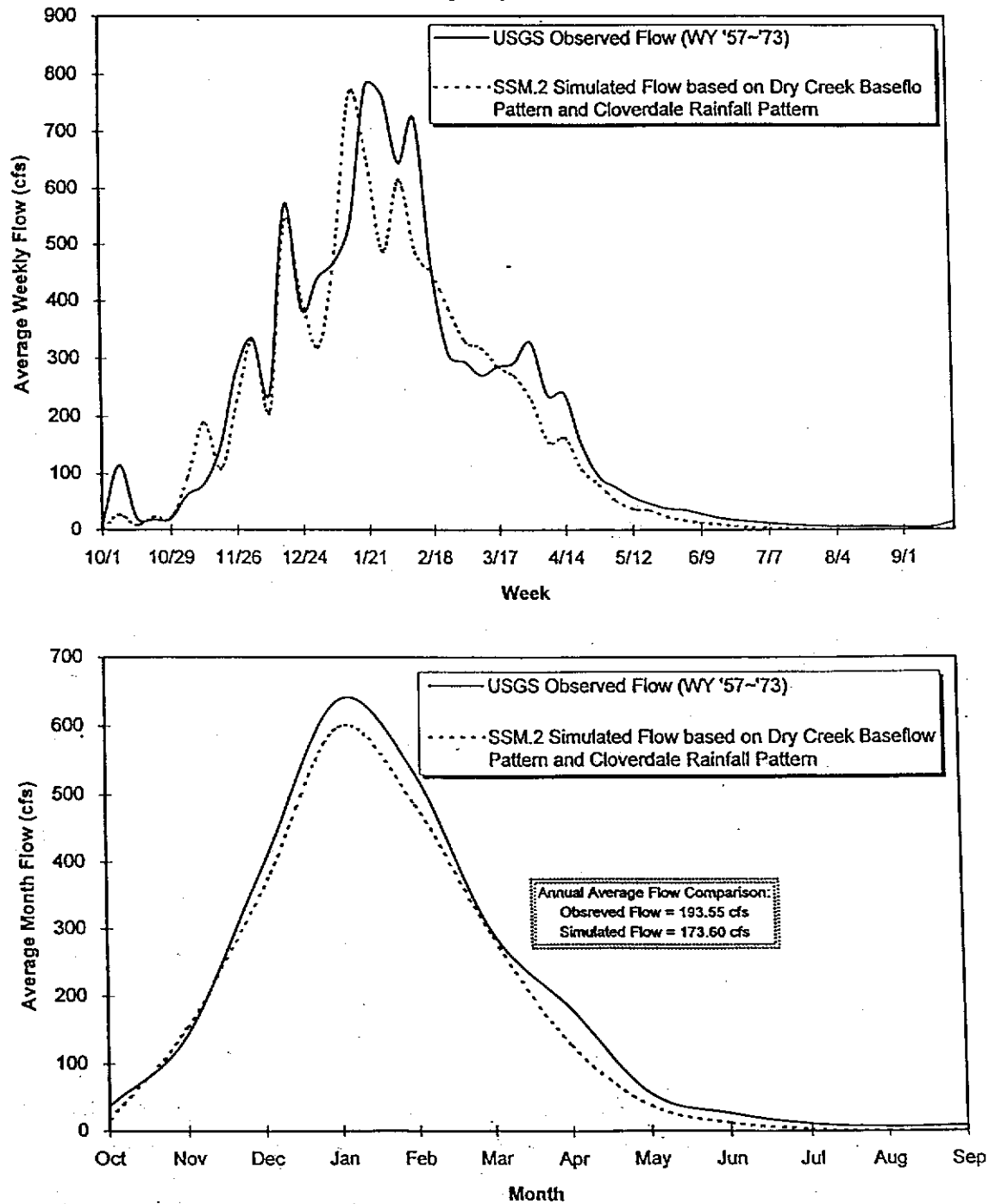


Figure 6: Verification between Observed and Simulated Flows
for Big Sulphur Creek



To evaluate the significance of the precipitation pattern, staff ran the SSM model using precipitation data from Ukiah, Cloverdale, Healdsburg, Santa Rosa and Graton gages. The model produced similar results using rainfall data from each gage.

The model was also evaluated using similar time periods for precipitation and streamflow for each subbasin. For example, precipitation data for 1961 to 1981 were used in the evaluation of Macaama Creek to provide comparable periods of record for the precipitation and streamflow data. The results had greater variation to the results archived using the procedures described above.

6.0 SENSITIVELY ANALYSIS

During the development of the SSM model, staff conducted sensitivity analysis to determine the influence of various parameters including:

- . Soil complex number (CN)
- . Mean annual precipitation (MAP)
- . Basin area (BA)

Table 3 below provides a summary of this analysis.

Table 3: Summary of Sensitivity Analysis for SSM Model
West Fork Russian River above Ukiah

Test Run	Basin Area (mi ²)	MAP (in.)	CN	SSM.2 Simulated Annual Avg. Flow (cfs)	R Square	Slope of Line
Base Run	96.0	41.34	75.99	196.29	0.9857	1.1283
110% BA	105.6	41.34	75.99	204.62	0.9857	1.2414
90% BA	86.4	41.34	75.99	187.02	0.9856	1.0159
110% MAP	96.0	45.47	75.99	235.04	0.9823	1.1778
90% MAP	96.0	37.21	75.99	174.08	0.9892	1.0725
110% CN	96.0	41.34	83.59	215.79	0.9739	1.3346
90% CN	96.0	41.34	68.39	176.69	0.9914	0.9975

Dry Creek near Cloverdale

Test Run	Basin Area (mi ²)	MAP (in.)	CN	SSM.2 Simulated Annual Avg. Flow (cfs)	R Square	Slope of Line
Base Run	89.13	51.09	76.94	185.31	0.9877	1.1155
110% BA	98.04	51.09	76.94	203.69	0.9879	1.2277
90% BA	80.22	51.09	76.94	166.65	0.9878	1.0047
110% MAP	89.13	56.20	76.94	195.50	0.9850	1.1745
90% MAP	89.13	45.98	76.94	173.65	0.9895	1.0475
110% CN	89.13	51.09	84.63	232.58	0.9717	1.3564
90% CN	89.13	51.09	69.25	156.65	0.9878	0.9530

7.0 SUMMARY OF INPUT DATA

The table below provides a summary of the input data used in the SSM model.

Tributary	Area (sq. mi)	L _r (mi)	L _c (mi)	Elevation Difference (ft)	CMAF* (in)	C-CN**	Rainfall Pattern
Dooly/Mc Dowell Creek	15.28	8.48	5.19	2444	38.08	79.51	Ukiah
Forsythe Creek	47.69	13.04	7.72	1674	42.9	76.74	Ukiah
Hensley Creek	8.31	6.69	4.25	1771	39.37	78.63	Ukiah
Howell Creek	8.61	5.29	3.45	2158	36.52	76.39	Ukiah
Mc Nab Creek	13.13	5.6	3.46	2233	40.12	71.76	Ukiah
Mill Creek	2.5	1.8	1	500	35.91	80.42	Ukiah
Robinson Creek	26.27	8.44	4.37	2240	44.26	71.14	Ukiah
York Creek	12.31	7.94	4.36	1682	38.76	77.65	Ukiah
Austin Creek	72.06	15.75	8.63	2289	57.14	70.77	Cloverdale
Big Sulphur Creek	85.76	19.98	11.84	3200	50.84	75.85	Cloverdale
Dry Creek	216.84	39.07	17.89	2741	49.96	72.49	Cloverdale
Gird Creek	3.27	3.29	2.15	1239	49.54	69.02	Healdsburg
Maacama Creek	66.98	12.44	7	4160	47.44	77.77	Healdsburg
Sausal Creek	12.83	7.03	5.02	2888	52.22	78.11	Healdsburg
Windsor Creek	27.51	9.19	4.98	720	41.3	75.68	Healdsburg
Mark West Creek	51.52	22.8	11.6	1926	41.33	78.68	Santa Rosa
Santa Rosa Creek	178.07	26.17	14.93	2130	35.81	83.17	Santa Rosa
Dutch Bill Creek	11.41	6.22	3.62	1240	50.16	70.77	Graton
Green Valley Creek	36.47	12.77	7.47	580	42.16	71.5	Graton
Jenner Gulch	2.03	3.12	1.78	1560	49.87	70.77	Graton

* CMAF - Composite Mean Annual Precipitation

** C-CN - Composite CN Value

8.0 MODEL RESULTS

Table 5 provides a summary of the average weekly, monthly and average annual flow data for each of the subbasins within the Russian River watershed.

9.0 SUMMARY AND CONCLUSIONS

A hydrologic model is essentially a tool that can be used to estimate streamflow. There are numerous assumptions and input parameters that are used in the development of the model and can affect the results.

Comparison of the theoretical unimpaired streamflow to the USGS flow measurements in the four subbasins used to verify the results of the SSM model indicate that the model produces results that sufficiently accurate for the intended purposes of this study. One of the primary purposes of the model is to produce average annual unimpaired flow data that can then be used to develop instream fish flow requirements, as described in section 4.0 of the Staff Report and Attachment B.

Table 5: Russian River SSM.2 Results (Flow in cfs)

Basin Name	Austin Creek		Big Sulphur Creek		Dooly Creek		Dry Creek	
Basin Area	72.06 mi ²		85.76 mi ²		15.28 mi ²		216.84 mi ²	
Rain Pattern	Cloverdale		Cloverdale		Ukiah		Cloverdale	
Wk beginning	Weekly	Monthly	Weekly	Monthly	Weekly	Monthly	Weekly	Monthly
1-Oct	1	11.00	1	16.40	0	2.00	2	31.40
8-Oct	16		27		2		44	
15-Oct	7		8		2		21	
22-Oct	14		24		2		40	
29-Oct	17		22		4		50	
5-Nov	62	110.75	93	154.00	9	18.75	171	308.00
12-Nov	135		190		15		361	
19-Nov	74		108		13		204	
26-Nov	172		225		38		496	
3-Dec	260	284.80	331	361.00	58	60.80	759	826.60
10-Dec	163		210		42		480	
17-Dec	428		542		69		1212	
24-Dec	321		402		77		946	
31-Dec	252		320		58		736	
7-Jan	379	478.25	484	598.50	63	98.25	1074	1388.75
14-Jan	620		768		136		1810	
21-Jan	525		655		104		1530	
28-Jan	389		487		90		1141	
4-Feb	497	385.00	616	484.50	107	74.25	1464	1118.00
11-Feb	381		486		60		1073	
18-Feb	359		449		78		1060	
25-Feb	303		387		52		875	
3-Mar	260	228.20	330	286.20	51	48.20	765	676.60
10-Mar	249		319		46		726	
17-Mar	232		286		54		695	
24-Mar	216		269		50		646	
31-Mar	184		227		40		551	
7-Apr	131	106.25	156	126.50	28	22.50	393	319.25
14-Apr	137		163		29		411	
21-Apr	89		106		19		269	
28-Apr	68		81		14		204	
5-May	45	31.50	53	37.50	9	6.50	134	94.00
12-May	32		38		7		95	
19-May	29		35		6		87	
26-May	20		24		4		60	
2-Jun	15	10.25	18	12.25	3	2.00	45	31.25
9-Jun	11		13		2		34	
16-Jun	9		11		2		27	
23-Jun	6		7		1		19	
30-Jun	4	3.00	5	3.60	1	0.60	13	9.00
7-Jul	4		4		1		11	
14-Jul	3		4		1		9	
21-Jul	2		3		0		6	
28-Jul	2		2		0		6	
4-Aug	1	1.00	2	1.25	0	0.00	4	2.50
11-Aug	1		1		0		2	
18-Aug	1		1		0		2	
25-Aug	1		1		0		2	
1-Sep	1	1.00	1	1.50	0	0.00	2	3.00
8-Sep	1		1		0		2	
15-Sep	1		2		0		4	
22-Sep	1		2		0		4	
Average	137.13		173.08		27.83		399.56	

Table 5: Russian River SSM.2 Results (Flow in cfs) - cont'd

Basin Name	Dutch Bill Creek		Forsythe Creek		Green Valley Cree		Gird Creek	
Basin Area	11.41 mi ²		47.69 mi ²		36.47 mi ²		3.27 mi ²	
Rain Pattern	Graton		Ukiah		Graton		Healdsburg	
Wk beginning	Weekly	Monthly	Weekly	Monthly	Weekly	Monthly	Weekly	Monthly
1-Oct	0	1.60	0	5.80	0	4.40	0	0.20
8-Oct	2		6		5		0	
15-Oct	1		5		4		0	
22-Oct	2		6		5		0	
29-Oct	3		12		8		1	
5-Nov	7	15.25	28	57.75	17	39.50	1	3.25
12-Nov	17		46		40		3	
19-Nov	10		40		24		2	
26-Nov	27		117		77		7	
3-Dec	44	42.00	180	189.40	130	124.80	11	12.00
10-Dec	23		131		71		7	
17-Dec	53		217		152		15	
24-Dec	52		239		156		16	
31-Dec	38		180		115		11	
7-Jan	50	72.00	196	307.50	142	213.50	14	19.75
14-Jan	103		427		307		26	
21-Jan	77		325		230		21	
28-Jan	58		282		175		18	
4-Feb	78	54.50	333	231.50	236	163.25	22	15.50
11-Feb	51		188		143		14	
18-Feb	55		244		168		15	
25-Feb	34		161		106		11	
3-Mar	38	34.60	156	148.40	117	107.80	10	9.60
10-Mar	36		141		108		10	
17-Mar	38		167		119		10	
24-Mar	33		154		105		10	
31-Mar	28		124		90		8	
7-Apr	21	17.00	87	70.25	66	53.50	6	4.75
14-Apr	22		90		69		6	
21-Apr	14		59		45		4	
28-Apr	11		45		34		3	
5-May	7	5.00	29	20.50	23	16.00	2	1.25
12-May	5		21		16		1	
19-May	5		19		15		1	
26-May	3		13		10		1	
2-Jun	2	1.50	10	6.75	8	5.50	1	0.50
9-Jun	2		7		6		1	
16-Jun	1		6		5		0	
23-Jun	1		4		3		0	
30-Jun	1	0.60	3	1.80	2	1.60	0	0.00
7-Jul	1		2		2		0	
14-Jul	1		2		2		0	
21-Jul	0		1		1		0	
28-Jul	0		1		1		0	
4-Aug	0	0.00	1	0.25	1	0.25	0	0.00
11-Aug	0		0		0		0	
18-Aug	0		0		0		0	
25-Aug	0		0		0		0	
1-Sep	0	0.00	1	1.00	0	0.50	0	0.00
8-Sep	0		1		0		0	
15-Sep	0		1		1		0	
22-Sep	0		1		1		0	
Average	20.29		86.71		60.79		5.56	

Table 5: Russian River SSM.2 Results (Flow in cfs) - cont'd

Basin Name	Hensley Creek		Howell Creek		Jenner Gulch		McNab Creek	
Basin Area	8.31 mi ²		8.61 mi ²		2.03 mi ²		13.13 mi ²	
Rain Pattern	Ukiah		Ukiah		Graton		Ukiah	
Wk beginning	Weekly	Monthly	Weekly	Monthly	Weekly	Monthly	Weekly	Monthly
1-Oct	0	1.00	0	1.00	0	0.20	0	1.60
8-Oct	1		1		0		2	
15-Oct	1		1		0		1	
22-Oct	1		1		0		2	
29-Oct	2		2		1		3	
5-Nov	5	10.25	4	8.25	1	2.75	5	11.00
12-Nov	8		5		3		6	
19-Nov	7		5		2		7	
26-Nov	21		19		5		26	
3-Dec	31	33.20	29	30.80	8	7.40	43	44.80
10-Dec	23		21		4		30	
17-Dec	38		35		9		50	
24-Dec	42		40		9		58	
31-Dec	32		29		7		43	
7-Jan	34	53.50	31	51.00	9	12.75	45	74.50
14-Jan	74		71		18		105	
21-Jan	57		55		14		80	
28-Jan	49		47		10		68	
4-Feb	58	40.50	56	38.50	14	9.75	84	56.50
11-Feb	33		30		9		42	
18-Feb	43		41		10		61	
25-Feb	28		27		6		39	
3-Mar	27	26.00	27	25.60	7	6.20	40	37.80
10-Mar	25		24		6		35	
17-Mar	29		29		7		42	
24-Mar	27		26		6		39	
31-Mar	22		22		5		33	
7-Apr	15	12.25	16	12.75	4	3.25	24	19.25
14-Apr	16		16		4		25	
21-Apr	10		11		3		16	
28-Apr	8		8		2		12	
5-May	5	3.50	5	3.75	1	1.00	8	5.75
12-May	4		4		1		6	
19-May	3		4		1		5	
26-May	2		2		1		4	
2-Jun	2	1.25	2	1.25	0	0.00	3	2.00
9-Jun	1		1		0		2	
16-Jun	1		1		0		2	
23-Jun	1		1		0		1	
30-Jun	1	0.20	1	0.20	0	0.00	1	0.60
7-Jul	0		0		0		1	
14-Jul	0		0		0		1	
21-Jul	0		0		0		0	
28-Jul	0		0		0		0	
4-Aug	0	0.00	0	0.00	0	0.00	0	0.00
11-Aug	0		0		0		0	
18-Aug	0		0		0		0	
25-Aug	0		0		0		0	
1-Sep	0	0.00	0	0.00	0	0.00	0	0.00
8-Sep	0		0		0		0	
15-Sep	0		0		0		0	
22-Sep	0		0		0		0	
Average	15.13		14.42		3.60		21.15	

Table 5: Russian River SSM.2 Results (Flow in cfs) - cont'd

Basin Name	Maacama Creek		Mark West Creek		Mill Creek		Robinson Creek	
Basin Area	66.98 mi ²		51.52 mi ²		2.5 mi ²		26.27 mi ²	
Rain Pattern	Healdsburg		Santa Rosa		Ukiah		Ukiah	
Wk beginning	Weekly	Monthly	Weekly	Monthly	Weekly	Monthly	Weekly	Monthly
1-Oct	1	11.40	0	7.80	0	0.20	0	3.00
8-Oct	11		8		0		3	
15-Oct	6		5		0		3	
22-Oct	14		8		0		3	
29-Oct	25		18		1		6	
5-Nov	51	109.50	28	59.25	1	2.75	10	23.75
12-Nov	129		60		2		15	
19-Nov	75		33		2		15	
26-Nov	183		116		6		55	
3-Dec	264	298.20	181	195.80	9	9.60	89	93.20
10-Dec	173		113		7		63	
17-Dec	393		241		11		105	
24-Dec	390		263		12		120	
31-Dec	271		181		9		89	
7-Jan	358	466.50	212	311.75	10	16.00	94	155.00
14-Jan	592		413		22		218	
21-Jan	497		344		17		166	
28-Jan	419		278		15		142	
4-Feb	511	368.50	351	248.00	17	12.00	171	116.50
11-Feb	369		225		10		90	
18-Feb	336		234		13		124	
25-Feb	258		182		8		81	
3-Mar	247	227.80	175	166.00	8	7.80	80	76.60
10-Mar	260		177		7		72	
17-Mar	233		177		9		86	
24-Mar	221		166		8		79	
31-Mar	178		135		7		66	
7-Apr	122	99.00	94	76.00	5	3.75	48	39.00
14-Apr	127		98		5		50	
21-Apr	84		64		3		33	
28-Apr	63		48		2		25	
5-May	41	29.00	32	22.50	2	1.25	16	11.50
12-May	29		23		1		12	
19-May	27		21		1		11	
26-May	19		14		1		7	
2-Jun	14	9.50	11	7.25	1	0.25	6	3.75
9-Jun	10		8		0		4	
16-Jun	8		6		0		3	
23-Jun	6		4		0		2	
30-Jun	4	2.80	3	2.40	0	0.00	2	1.20
7-Jul	3		3		0		1	
14-Jul	3		2		0		1	
21-Jul	2		2		0		1	
28-Jul	2		2		0		1	
4-Aug	1	1.00	1	0.25	0	0.00	1	0.25
11-Aug	1		0		0		0	
18-Aug	1		0		0		0	
25-Aug	1		0		0		0	
1-Sep	1	1.00	1	1.00	0	0.00	0	0.50
8-Sep	1		1		0		0	
15-Sep	1		1		0		1	
22-Sep	1		1		0		1	
Average	135.33		91.62		4.46		43.67	

Table 5: Russian River SSM.2 Results (Flow in cfs) - cont'd

Basin Name	Santa Rosa Creek		Sausal Creek		Windsor Creek		York Creek	
Basin Area	178.07 mi ²		12.83 mi ²		27.51 mi ²		12.31 mi ²	
Rain Pattern	Santa Rosa		Healdsburg		Healdsburg		Ukiah	
Wk beginning	Weekly	Monthly	Weekly	Monthly	Weekly	Monthly	Weekly	Monthly
1-Oct	1	34.20	0	2.40	0	3.60	0	1.60
8-Oct	36		2		4		2	
15-Oct	17		1		3		1	
22-Oct	35		3		4		2	
29-Oct	82		6		7		3	
5-Nov	126	241.25	12	24.50	14	32.50	7	13.75
12-Nov	256		30		33		10	
19-Nov	142		17		21		9	
26-Nov	441		39		62		29	
3-Dec	667	721.40	54	61.60	95	105.20	45	47.20
10-Dec	419		36		62		32	
17-Dec	893		82		134		54	
24-Dec	961		80		139		60	
31-Dec	667		56		96		45	
7-Jan	790	1130.75	75	95.50	121	169.00	48	77.00
14-Jan	1483		120		220		107	
21-Jan	1241		101		183		82	
28-Jan	1009		86		152		71	
4-Feb	1264	903.00	103	75.25	190	133.25	84	57.75
11-Feb	837		78		123		46	
18-Feb	839		67		127		61	
25-Feb	672		53		93		40	
3-Mar	639	605.00	50	45.80	91	85.40	40	37.80
10-Mar	656		54		92		36	
17-Mar	639		46		90		42	
24-Mar	604		44		84		39	
31-Mar	487		35		70		32	
7-Apr	330	265.25	24	19.00	50	40.50	22	18.00
14-Apr	338		24		52		23	
21-Apr	226		16		34		15	
28-Apr	167		12		26		12	
5-May	110	77.25	8	5.75	17	12.00	8	5.25
12-May	78		6		12		5	
19-May	72		5		11		5	
26-May	49		4		8		3	
2-Jun	37	25.50	3	2.00	6	3.75	3	2.00
9-Jun	28		2		4		2	
16-Jun	22		2		3		2	
23-Jun	15		1		2		1	
30-Jun	11	7.40	1	0.60	2	1.20	1	0.60
7-Jul	9		1		1		1	
14-Jul	7		1		1		1	
21-Jul	5		0		1		0	
28-Jul	5		0		1		0	
4-Aug	3	1.75	0	0.00	1	0.25	0	0.00
11-Aug	1		0		0		0	
18-Aug	1		0		0		0	
25-Aug	2		0		0		0	
1-Sep	2	2.50	0	0.00	0	0.50	0	0.00
8-Sep	2		0		0		0	
15-Sep	3		0		1		0	
22-Sep	3		0		1		0	
Average	335.17		27.69		48.92		21.75	

ATTACHMENT B

**EVALUATION OF MEASURES NEEDED
TO PROTECT FISHERY RESOURCES**

ATTACHMENT B

EVALUATION OF MEASURES NEEDED TO PROTECT FISHERY RESOURCES OF THE RUSSIAN RIVER WATERSHED

1.0 SCOPE OF INVESTIGATION

The primary focus of this investigation is the protection of anadromous fishery resources within the Russian River watershed in relation to pending and possible future water right applications. There are four species of concern, coho salmon (*Oncorhynchus kisutch*), steelhead (*O. mykiss*), chinook salmon (*O. tshawytscha*) and American shad (*Alosa sapidissima*), within the Russian River watershed. Coho and steelhead are of special interest due to their consideration under the Federal Endangered Species Act (see Sections 2.1 and 2.2 below). The goal of this analysis is the determination of the appropriate instream flow criteria to protect the fishery resources of the Russian River watershed.

2.0 POPULATION TRENDS

Anadromous fish populations have declined over the last 50 years, statewide as well as within the Russian River watershed. Numerous factors have contributed to the decline of the anadromous fisheries of the Russian River. Many of these factors were identified by agencies and other interested parties at SWRCB workshops and include:

- The construction and operation of Coyote and Warm Springs dams, which blocked access to miles of habitat, altered river flow and temperature regimes, and blocked sediment transport;
- Other impoundments on tributaries that have effects similar to the major impoundments;
- Direct diversion of water, especially those during the summer months when flows are low and habitat is limited;
- Unscreened water diversions;
- Instream gravel mining, which has effected riparian habitat and river morphology;
- Land use practices including agriculture, timber harvesting, and urbanization;
- Water quality degradation due to agricultural, industrial, municipal, and domestic discharges to the river;

- Oceanic conditions;
- Commercial and sport fishing pressure;
- Operation of fish hatcheries; and
- Introduction of exotic fishes (Table 2.0-1) has also affected the salmonid fish populations within the watershed.

Anadromous fisheries depend on the proper combination of several factors to maintain healthy populations. Within freshwater systems, these factors include: flow, temperature, dissolved oxygen, water quality, substrate conditions, availability of appropriate cover, and riparian habitat. Several agencies and environmental organizations are conducting studies and/or completing projects designed to restore habitat for salmonid fishery resources within the watershed (see Section 1.5 of the *Russian River Watershed Staff Report*).

2.1 Coho Salmon Coho adult spawning populations in the 1940s have been estimated to range anywhere from 200,000 to nearly one million throughout the state (Moyle, et al., 1995). By the 1980s, the statewide average for coho was around 33,500 (Brown et al., 1994). The Russian River supported a commercial salmon fishery at the turn of the century. Unfortunately, no estimates of population size were ever recorded. The Russian River population has declined from 7,000 in 1975 to less than 1,000 in the 1990s (Steiner Environmental Consulting (SEC), 1996).

The National Marine Fisheries Service (NMFS) issued a final rule listing the Central California Evolutionarily Significant Unit (ESU) of coho as threatened under the federal Endangered Species Act (61 FR 56138, October 31, 1996). The Central California ESU extends from Punta Gorda in Humboldt County south to the San Lorenzo River in Santa Cruz County, and includes the Russian River. The effective date of the listing was December 2, 1996.

Coho were also listed under the California Endangered Species Act as endangered south of San Francisco Bay to the San Lorenzo River in Santa Cruz County.

2.2 Steelhead The historic state population of steelhead, excluding the Klamath River Province, was 412,000 fish. At present, the population contains approximately 39,000 individuals, not including hatchery stocks (NMFS, 1994). Within the Russian River watershed, population estimates range between 20,000 and 60,000 in the 1880s and between 10,000 and 20,000 at present, including hatchery fish (SEC, 1996).

The Central California Coast ESU, identified by NMFS for steelhead, begins with the Russian River watershed and extends south to Soquel Creek in Santa Cruz County. NMFS has determined

Table 2.0-1: Listing of 48 native and introduced fish species documented to exist or have existed in the Russian River (taken from Steiner Environmental Consulting, 1996)

Common Name	Scientific Name	Native/Introduced	Status ^A
River Lamprey	<i>Lampetra ayresi</i>	N	?
Western Brook Lamprey	<i>Lampetra richardsoni</i>	N	?
Pacific Lamprey	<i>Lampetra tridentata</i>	N	C, S
Green Sturgeon	<i>Acipenser medirostris</i>	N	R
White Sturgeon	<i>Acipenser transmontanus</i>	N	R
California Roach	<i>Hesperoleucus symmetricus</i>	N	C
Hitch	<i>Lavinia exilicauda</i>	N	?
Hardhead	<i>Mylopharodon conocephalus</i>	N	C
Sacramento Squawfish	<i>Ptychocheilus grandis</i>	N	C
Sacramento Sucker	<i>Catostomus occidentalis</i>	N	C
Pink Salmon	<i>Oncorhynchus gorbuscha</i>	N	PE
Coho Salmon	<i>Oncorhynchus kisutch</i>	N	R, S
Steelhead Trout	<i>Oncorhynchus mykiss</i>	N	C, S
Chinook Salmon	<i>Oncorhynchus tshawytscha</i>	N	R, S
Threespine Stickleback	<i>Gasterosteus aculeatus</i>	N	C
Coastrange Sculpin	<i>Cottus aleuticus</i>	N	C
Prickly Sculpin	<i>Cottus asper</i>	N	C
Riffle Sculpin	<i>Cottus gulosus</i>	N	C
Russian River Tule Perch	<i>Hysterocarpus traski pomo</i>	N	R
American Shad	<i>Alosa sapidissima</i>	I	S
Goldfish	<i>Carassius auratus</i>	I	C
Carp	<i>Cyprinus carpio</i>	I	C
Sacramento Blackfish	<i>Orthodon microlepidotus</i>	I	?
White Catfish	<i>Ameiurus catus</i>	I	?
Black Bullhead	<i>Ameiurus melas</i>	I	?
Brown Bullhead	<i>Ameiurus nebulosus</i>	I	?
Channel Catfish	<i>Ictalurus punctatus</i>	I	?
Lake Whitefish	<i>Coregonus clupeaformis</i>	I	PE
Cutthroat Trout	<i>Oncorhynchus clarki</i>	I	PE
Atlantic Salmon	<i>Salmo salar</i>	I	PE
Brown Trout	<i>Salmo trutta</i>	I	R
Eastern Brook Trout	<i>Salvelinus fontinalis</i>	I	PE
Lake Trout	<i>Salvelinus namaycush</i>	I	PE
Western Mosquitofish	<i>Gambusia affinis</i>	I	R?
Inland Silversides	<i>Menidia beryllina</i>	I	?
Striped Bass	<i>Morone saxatilis</i>	I	R
Sacramento Perch	<i>Archoplites interruptus</i>	I	?
Green Sunfish	<i>Lepomis cyanellus</i>	I	C
Bluegill	<i>Lepomis macrochirus</i>	I	C
Redear Sunfish	<i>Lepomis microlophus</i>	I	?
Smallmouth Bass	<i>Micropterus dolomieu</i>	I	C
Largemouth Bass	<i>Micropterus salmoides</i>	I	C
Splittail	<i>Pogonichthys macrolepidotus</i>	I	?
Fathead Minnow	<i>Pimephales promelas</i>	I	?
Golden Shiner	<i>Notemigonus crysoleucas</i>	I	?
White Crappie	<i>Pomoxis annularis</i>	I	?
Black Crappie	<i>Pomoxis nigromaculatus</i>	I	?
Yellow Perch	<i>Perca flavescens</i>	I	PE

A: C=common, R=rare, PE= probably extinct, S=seasonal, ?=status uncertain

that steelhead within this ESU be listed as threatened. Final action to list steelhead under the federal Endangered Species Act was announced August 11, 1997. Steelhead are not currently listed under the California Endangered Species Act.

2.3 Chinook Salmon Chinook occur in the Russian River in very low numbers. It is uncertain whether this population is naturally occurring or due solely to introductions and straying from Central Valley rivers. Very little information is available on population numbers. Estimates have ranged from 1,000 in 1966 and 0 in 1981 (SEC, 1996).

2.4 American Shad Shad are not native to California. However, after their establishment in the Russian River, shad have become an important sport fishery. The shad population was estimated to be between 11,000 and 22,000 fish in the Russian River during the early 1970s and have experienced a notable decline (SEC, 1996).

3.0 LIFE HISTORY

3.1 General Salmonid Coho, steelhead, and chinook are anadromous salmonids. The life cycle begins as adult fish migrate from the ocean into streams. The adults lay their eggs in suitable gravel substrates. Coho and chinook die after spawning. Steelhead may return to the ocean and make several spawning runs during their lifetime. The alevin remain in the gravels after hatching. When the yolk sack is nearly absorbed, they emerge from the gravels as fry. The fry remain in the stream for various lengths of time, depending on species. The young fish migrate to the ocean as smolts and begin their rapid growth phase. After a period of one or more years, again depending on species, the maturing adults will return to their natal stream to repeat the cycle.

The general life histories of the three species are similar, however, the timing of life history stages differ (Figure 3.0-1). Specific habitat requirements between the two species also vary. Croot and Margolis (1991) provide thorough discussions of coho and chinook life histories. Shapovalov and Taft (1954) present life history information on steelhead as well as coho in California. Steiner Environmental Consulting (1996) and Sonoma County Water Agency (1996) discuss life history and habitat requirements for all three species in relation to the Russian River.

3.2 Coho Salmon Within the Russian River, coho generally begin the spawning migration in November and continue through January, with the majority of spawning occurring in December. Coho spend one year in fresh water after hatching. Outmigration takes place in the spring. Most coho spend two years in the ocean, although some will return to fresh water after only one year and others

Chinook

Upstream migration
Spawning
Incubation
Emergence
Juvenile rearing
Smolt emigration

Coho

Upstream migration
Spawning
Incubation
Emergence
Juvenile rearing
Smolt emigration

Steelhead

Upstream migration
Spawning
Incubation
Emergence
Juvenile rearing
Smolt emigration

American Shad

Upstream migration
Spawning
Juvenile rearing
Juvenile emigration

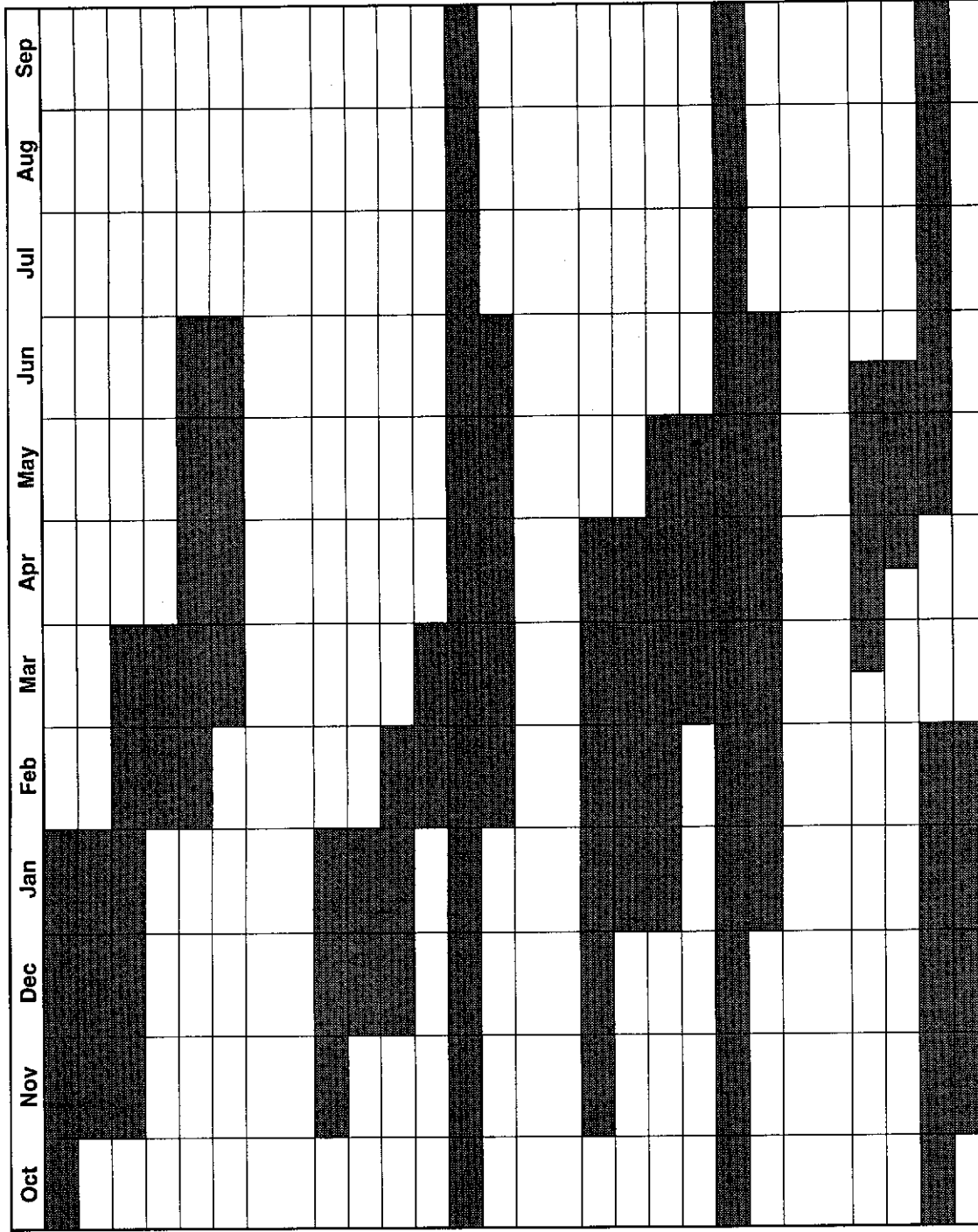


Figure 3.0-1 TIMING OF LIFE HISTORY STAGES IN THE RUSSIAN RIVER FOR CHINOOK, COHO, STEELHEAD, AND AMERICAN SHAD
(Sources: Trinity Associates Inc., 1994; Steiner Environmental Consulting, 1996)

after three years. Coho die after spawning. Coho spawn mainly in the lower tributaries of the Russian River watershed (Table 3.0-1) (SEC, 1996).

3.3 Steelhead The spawning run for steelhead begins in December and continues through April, with most spawning occurring from January through April. Steelhead will remain in freshwater for one to four years after hatching. Outmigration usually occurs during the spring. Ocean residence for steelhead lasts one to three years. Steelhead are capable of making several spawning runs during their lifetime. Steelhead spawn in tributaries where fish travel upstream as far as flows permit (Table 3.0-1) (SEC, 1996).

3.4 Chinook Salmon The chinook run lasts from August through January, with most spawning occurring in November and December. Residence time in fresh water is generally from two to four months. Chinook spend from one to seven years in the ocean before returning to fresh water to spawn. Most spawning adults are between two and four years old. Chinook die after spawning. Chinook spawn within the main channel of the Russian River and also in Dry Creek (SEC, 1996).

3.5 American Shad Upstream migration occurs in the spring and early summer as water temperatures rise. Spawning usually occurs over gravel or sand bottoms in areas with good current. Eggs and milt are released into the water column for fertilization. The eggs are slightly buoyant and either drift with the current or rest on the bottom until they hatch. The length of time until hatching depends on water temperature, but usually occurs within four to six days. Juveniles remain in fresh water for several months and migrate to the ocean in the fall (US Army Corps of Engineers, 1982).

4.0 STREAM FLOW CRITERIA

Prior to the advent of current fish habitat evaluation techniques, fishery biologists relied solely on personal experience to establish fish flow criteria. In developing stream flow criteria, the analyst must recognize that fish populations evolved under varying annual hydrologies and took advantage of changes in river flow during different stages of their life cycle. One steady flow throughout the year does not reflect the natural condition and would not provide good habitat for the various life stages of fish nor provide the channel forming events that are needed to maintain the streams geomorphic features.

There have been many methods developed for establishing stream flow protection. These methods tend to fall out on a continuum between two categories, standard-setting and incremental

Table 3.0-1: Coho, steelhead, and rainbow trout streams within the Russian River Watershed (R. Coey and W. Cox, pers. com.).¹

Russian River	SH *
Jenner Gulch	
Willow Creek	SH CO ²
Sheephouse Creek	SH CO
Sawmill Gulch	
Slaughter House Gulch	
Freezeout Creek	SH CO
Orrs Creek	SH
Browns Gulch	
Austin Creek	SH CO
Kohute Gulch	SH *
Frazier Gulch	SH
Consolli Gulch	
Bull Barn Gulch	
Kidd Creek	SH *
East Austin Creek	SH *
Black Rock Creek	SH *
Gilliam Creek	SH *
Schoolhouse Creek	SH
Thompson Creek	SH
Gray Creek	SH
Lawhead Creek	
Devil Creek	SH
Conshea Creek	SH
Tiny Creek	SH
Sulphur Creek	SH
St. Elmo Creek	SH RT
Ward Creek	SH *
Big Oat Creek	SH
Pole Mountain Creek	SH
Blue Jay Creek	SH
Spring Creek	
Bone Creek	
Holmes Canyon	
Bear Pen Creek	SH
Red Slide Creek	SH *
Gravelly Springs Creek	
Sheridan Gulch	
Mesa Grande Gulch	
Monte Cristo Creek	
Harrison Gulch	
Dutch Bill Creek	SH *
Schoolhouse Gulch	
Crawford Gulch	
Tyrone Gulch	
Duvoul Creek	
Grub Creek	

1 This list is a compilation of recordings and professional knowledge of streams known to presently support these species and should not be considered comprehensive. A stream not shown to have any of the salmonid species may in fact contain those species, but no data are available.

2 SH Steelhead Trout
 RT Rainbow Trout
 CO Streams known to currently support coho salmon
 * Streams known to once have supported coho Salmon

Table 3.0-1 (cont.)

Alder Creek		
Baumert Springs Creek		
Lancel Creek	SH	
North Fork Lancel Creek	SH	
Smith Creek	SH CO	
Hulbert Creek	SH *	
Mission Creek	SH *	
Livereau Creek		
Fife Creek	SH	
Redwood Creek	SH	
Sweetwater Springs		
West Branch Fife Creek		
Pocket Canyon	SH	
Mays Canyon	SH	
Oregon Canyon		
Pasquini Canyon		
Hobson Creek	SH	
Mt. Jackson Creek	SH	
Green Valley Creek	SH CO	
Atascadero Creek	SH	
Jonive Creek	SH	
Redwood Creek	SH	
Purrington Creek	SH CO	
Mark West Creek	SH *	
Windsor Creek	SH	
Pool Creek	SH	
Wright Creek		
Laguna de Santa Rosa		
Santa Rosa Creek	SH	(parts)
Matanzas Creek	SH	
Spring Creek		
South Fork Matanzas Creek		
Rincon Creek		
Ducker Creek		
South Fork Santa Rosa Creek	SH	
Salt Creek		
Blucher Creek	SH	
Wilfred Creek	SH	
Gossage Creek	SH	
Washoe Creek	SH	
Hinebaugh Creek		
Crane Creek	SH	
Five Creek	SH	
Copeland Creek	SH	
Porter Creek	SH	
Mill Creek		
Humbug Creek	SH	
Deadhorse Creek		
Weeks Creek	SH	
Van Buren Creek		
Neal Creek		
Porter Creek	SH	
Press Creek	SH	
John Gordon Creek		
Scotts Creek		
Osborne Creek		
Turtle Creek	SH CO	

Table 3.0-1 (cont.)

Dry Creek	SH CO
Mill Creek	SH CO
Felta Creek	SH CO
Fox Canyon	
Wallace Creek	SH *
Palmer Creek	SH
Renevar Gulch	
Coldwater Gulch	
Angel Creek	SH
Boyd Creek	
Pickle Creek	
Pineridge Canyon	SH
Kelley Creek	
Crane Creek	SH
Dorman Canyon	
Grape Creek	SH
Wine Creek	SH
Pena Creek	SH *
Chapman Branch	
Boyer Creek	
Pechald Creek	
Sweetwater Creek	
Redwood Canyon	
Redwood Log Creek	SH
Woods Creek	
Wildcat Canyon	
Dutch Creek	
Fall Creek	
Schoolhouse Creek	
Warm Springs Dam	
Warm Springs Creek	RT
Little Warm Springs Creek	RT
Black Sulphur Creek	RT
Picnic Creek	RT
Bear Creek	RT
Seven Oaks Creek	RT
Rancheria Creek	RT
Little Rancheria Creek	RT
Strawberry Creek	RT
Little Strawberry Creek	RT
Wild Cattle Creek	RT
Willow Springs Creek	RT
Bearpen Creek	RT
Fall Creek	RT
Smith Creek	RT
Brush Creek	RT
Yorty Creek	RT
Cherry Creek	RT
Skunk Creek	RT
Snow Creek	RT
Anchor Creek	RT
Rail Creek	RT
Galloway Creek	RT
McChristian Creek	RT
Franks Canyon	RT
Soda Creek	RT
Big Foot Canyon	RT

(Lake Sonoma)

Table 3.0-1 (cont.)

Ingram Creek	RT
Elkhorn Creek	RT
Brooks Creek	SH
Barnes Creek	SH
Martin Creek	SH
Maacama Creek	SH CO
Franz Creek	SH
Bidwell Creek	SH
Redwood Creek	SH CO
Lafrabchi Creek	
Foote Creek	SH
Kellogg Creek	SH
Yellowjacket Creek	SH
Briggs Creek	SH
Little Briggs Creek	SH
Coon Creek	SH
Walker Creek	SH
Mill Stream	SH RT
McDonnell Creek	SH
Bluegum Creek	SH
Bear Creek	SH RT
Ingalls Creek	SH RT
Hoot Owl Creek	SH
Sausal Creek	SH
Deer Creek	
Bear Cabyon	
George Young Creek	SH
Burns Creek	SH
Grapevine Creek	
Lytton Creek	
Gird Creek	SH
Peterson Creek	
Miller Creek	SH
Wood Creek	
Gill Creek	SH
Crocker Creek	
Barrelli Creek	SH
Icaria Creek	SH
Porterfield Creek	SH
North Branch Porterfield Creek	
South Branch Porterfield Creek	
Cloverdale Creek	
Oat Valley Creek	SH
Big Sulphur Creek	SH
Little Sulphur Creek	SH
N. Branch Little Sulphur Creek	SH
Lovers Gulch Creek	
Anna Belcher Creek	
Hurley Creek	
Frasier Creek	SH
Cascade Creek	
Boggs Creek	
Squaw Creek	SH
Alder Creek	
Hummingbird Creek	SH
Wildhorse Creek	
Coldwater Canyon	

Table 3.0-1 (cont.)

Bear Canyon		
Truitt Creek		
Geyser Canyon		
Cobb Creek		
Hot Springs Creek		
Ash Creek	SH	(Southern County Border)
Edwards Creek	SH	
Cummiskey Creek	SH	
McDonald Creek		
Pieta Creek	SH	(Squaw Rock)
Coleman Creek		
Salt Canyon		
Vasser Creek	SH	
Jakes Creek		
Sheldon Creek		
Salt Spring Creek		
Tyler Creek	SH	
Hoil Creek		
Feliz Creek	SH	(Hopland)
Duncan Creek		
Johnson Creek		
Young Creek		
Middle Fork Feliz Creek	SH	
North Fork Feliz Creek		
Dooley Creek	SH	(Old Hopland)
McDowell Creek		
Crawford Creek	SH	
McNab Creek	SH	
Parsons Creek	SH	
Morrison Creek		
Howell Creek	SH	
Robinson Creek	SH	
South Branch Robinson Creek	SH	
Skunk Creek		
Doolin Creek	SH	(Ukiah)
Gibson Creek	SH	
Mill Creek	SH	
McClure Creek	SH	
North Fork Mill Creek	SH	
Willow Creek		
Orrs Creek	SH	
Sulphur Creek	SH	(Vichy Springs)
Ackerman Creek	SH	
Alder Creek	SH	
Howard Creek		
Hensley Creek	SH	
East Fork Russian River	RT	
Coyote Dam	RT	(Lake Mendocino)
Cold Creek	RT	(Blue Lakes)
Mewhinney Creek	RT	
East Canal	RT	
White Creek	RT	
West Canal	RT	
Burright Creek	RT	
Bevans Creek	RT	(Potter Valley)
Busch Creek	RT	
Boyce Creek	RT	

Table 3.0-1 (cont.)

Adobe Creek	RT	
Williams Creek	RT	
Powerhouse Canal	RT	
Tunnel from Van Arsdale Reservoir .	RT	
York Creek	SH *	
Forsythe Creek	SH *	
Seward Creek	SH *	
Jack Smith Creek	SH *	
Eldridge Creek	SH *	
Bakers Creek		
Mill Creek	SH	
Walker Creek	SH	
Salt Hollow Creek	SH *	(Redwood Valley)
Rocky Creek	SH *	
Mariposa Creek	SH *	
Fisher Creek	SH *	
Corral Creek	SH *	
Dead Horse Canyon		

(Stalnaker, et al., 1995). Examples of standard-setting methods include: 'aquatic base flow' where the median flow for the lowest flow month is chosen as the minimum flow (Kulik, 1990); a technique that uses median monthly flows to mimic the natural stream flow pattern (Bovee, 1982); and, the Tennant Method (Tennant, 1976).

The Tennant Method, also known as the "Montana Method", is the most renowned of the standard-setting tools for fisheries (Stalnaker, et al., 1995). This technique provides a quick, easy method for determining stream flows to protect aquatic resources in both warm and cold water streams. The Tennant Method recommends stream flow to support varying qualities of fish habitat based on percentages of the mean annual flow (Tennant, 1976). The Tennant Method is considered a good "rule-of-thumb" technique (Stalnaker, et al., 1995).

Mid-range techniques that fall between basic standard-setting and incremental include: the "modified Tennant approach" which calls for a repetition of all of Tennant's steps and results in a set of recommendations tailored specifically to the species and stream of interest (Stalnaker, et al., 1995); the wetted perimeter technique (Nelson, 1980) which relates the stream's wetted perimeter to discharge; and, multiple attribute standard-setting methods of which the Physical Habitat Simulation System (PHABSIM) is most commonly used in California. PHABSIM analyzes the relationship between stream flow and physical habitat availability for various life stages of a species of fish incorporating several variables including: depth, mean column velocity, substrate composition, nose velocity, adjacent velocity, cover, and distance from cover (Hardy and Williamson, 1993).

The most commonly used incremental¹ technique used in California has been the Instream Flow Incremental Methodology (IFIM). The IFIM incorporates both macro- and microhabitat concepts. Macrohabitat characteristics include temperature, water quality, geology, slope, elevation, and water supply (Bovee, 1982). Microhabitat characteristics are the same variables used in PHABSIM analysis. An approach such as the IFIM typically requires hydrologic analyses, habitat models, sediment transport, water quality, and temperature analyses, along with trophic level studies, validation of species criteria, biomass studies, and population dynamics (Stalnaker, et al., 1995).

The California Department of Fish and Game (CDFG) recommends the use of the IFIM for establishing stream flows. However, the IFIM is expensive and difficult to justify for small water diversions. For these smaller water diversions, the application of a "Tennant" like approach would be desirable if it could be shown to produce results comparable to the more detailed IFIM and PHABSIM techniques.

Limited information is available on the relationships between anadromous fish and stream flows within the Russian River watershed. Decision 1610 (D-1610), issued by the SWRCB on April 17, 1986, established minimum instream flow requirements for the Russian River below Coyote dam and for Dry Creek below Warm Springs dam. The D-1610 minimum stream flows in the Russian River were established primarily for the benefit of recreational use and without the benefit of a habitat based flow study. Dry Creek stream flows were based somewhat on two stream flow studies conducted in the 1970s for the CDFG (Baracco, 1977) and the Army Corps of Engineers (Winzler and Kelly, 1978). The minimum flows in D-1610 are less than those recommended at the time by the CDFG. The SWRCB recognized that these flows could adversely affect the fisheries, and made findings of overriding considerations. Realizing that the minimum stream flows established under D-1610 could be improved with better information, the SWRCB invited the CDFG, along with Sonoma and Mendocino Counties, to conduct additional studies quantifying fishery flow needs. To date, neither the CDFG nor the counties have completed any studies which define the stream flows required within the main stem for healthy fisheries.

The tributaries to the Russian River provide important fishery habitat. The SWRCB has held several workshops on the Russian River to seek guidance from interested parties on the concerns that need to be addressed in considering the pending water right applications. Most of the experts agree that while the main stem

¹"Incrementalism is an approach to problem solving that refers to an institutional policy of slightly modifying procedures or positions from those previously established" (Bovee, 1982).

of the Russian River is an important migratory corridor and habitat for warm water fishes, the tributaries to the main stem are where the majority of the remaining cold water spawning and rearing habitat currently exist. Therefore, the SWRCB has been encouraged to develop stream flow criteria that can be applied to the tributaries. These criteria should protect cold water fish species from the potential effects of new water appropriations.

In the Russian River watershed, the IFIM has been used only once in a steelhead study conducted for Unocal by Harding Lawson Associates (1990) on Big Sulfur Creek. Baracco (1977) and Winzler and Kelly (1978) conducted IFIM type studies on lower Dry Creek. The Winzler and Kelly study also looked at the main stem of the Russian River. The IFIM based methodology is presently being used on Sausal Creek in association with Water Right Applications 29703 through 29708 and 29811 (Kendall-Jackson Winery) but those results are not yet available.

4.1 Analysis of Available Fishery Studies Flow data exists for several locations along the Russian River. Unfortunately, good comprehensive data on stream flow does not exist for most of the tributaries. The Simulated Stream Flow Model (SSM2) (see Appendix A of the *Russian River Watershed Staff Report*), developed for the SWRCB by the California State University at Sacramento, was used to determine the unimpaired flow for Big Sulphur Creek and Dry Creek for comparisons with instream flows determined to be required for the salmonid fisheries within these streams. The SSM2 takes rain fall data and converts it into average stream flow estimates.

Salmonid spawning occurs from November through April within the Russian River watershed (Figure 3.0-1). Rearing for both steelhead and coho occurs year round. Spawning flows are generally higher than rearing flows (Baracco, 1977; Winzler and Kelly, 1978; Snider, 1985; Smith, 1986; Harding Lawson Associates, 1990). Therefore, spawning flows were considered the limiting factor during the November through April period and rearing flows during the rest of the year. The flows that provide optimum habitat for the two life stages of salmonid species are expressed as a percentage of the average annual unimpaired flow for each stream to see if a common percentage exists for the various streams evaluated.

Big Sulphur Creek The SSM2 was used to determine the average unimpaired flow along Big Sulphur Creek where steelhead habitat had been quantified (Harding Lawson Associates, 1990). For this analysis the most downstream site that represented spawning habitat characteristic of this watershed was used. The most downstream site was used because SWRCB staff anticipates that future bypass terms for tributary watersheds will be determined from these downstream locations. The site on Big Sulphur Creek near Little Sulphur Creek met the above criteria.

The optimal spawning flows for steelhead in the Big Sulphur Creek watershed are the flows which correspond to the maximum total Weighted Usable Area (WUA) for spawning and rearing (Figure 4.1-1). The optimal spawning and rearing flows were then compared to the average annual unimpaired flows calculated by the SSM2. The optimum stream flow for spawning was 85 cfs at the lower end of the Big Sulphur Creek watershed. This represents 104% of the average annual unimpaired flow (81.44 cfs) at this site. The optimum rearing flows during the summer and fall period was lower (40 cfs) at the Little Sulphur Creek site. This flow represents 49 percent of the average annual unimpaired flow.

Dry Creek The SSM was also used to determine the average unimpaired flow for Dry Creek. Baracco (1977) first speculated that optimum spawning flows within Dry Creek were probably around 480 cfs. A later study by Winzler and Kelly (1978) determined that 400 cfs provided the optimum spawning habitat within Dry Creek. This more recent flow determination represents 100 percent of the average annual unimpaired flow (399 cfs). Neither of these studies used PHABSIM. However, spawning habitat

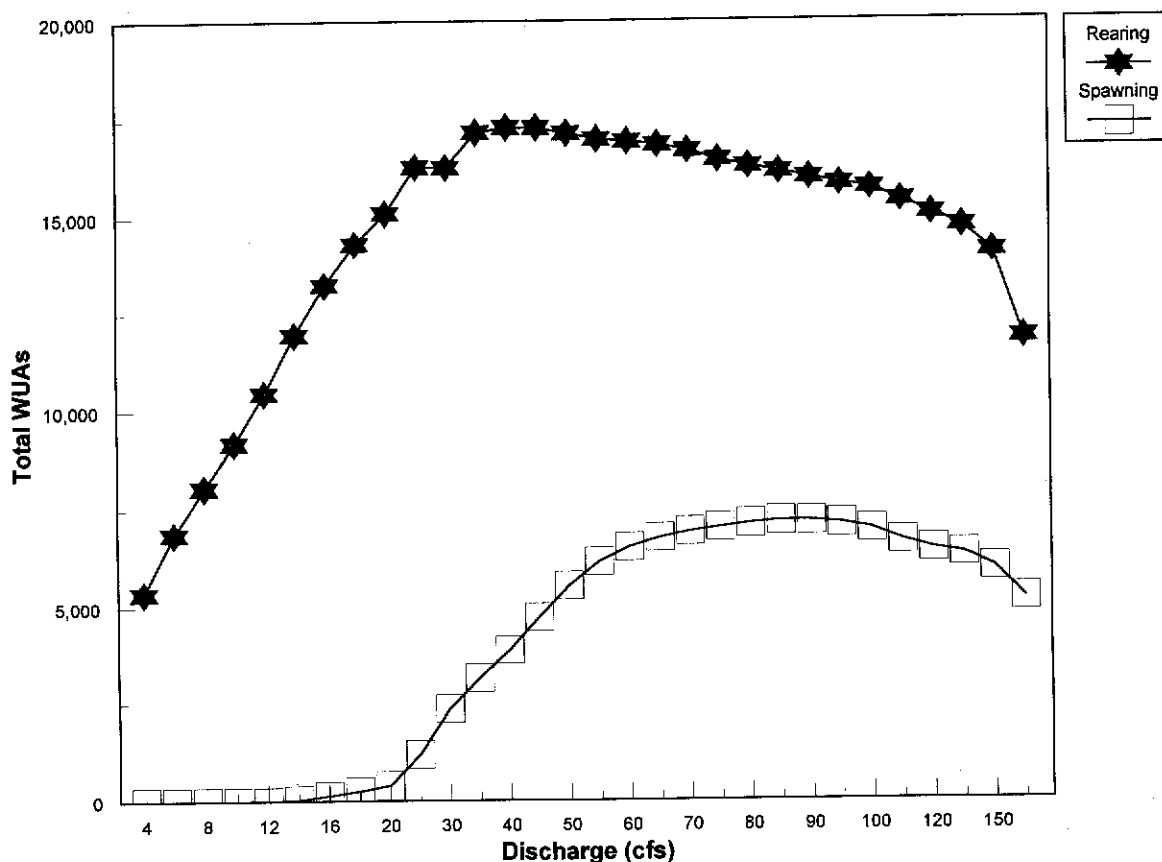


Figure 4.1-1: Total Weighted Usable Area vs. Discharge at Little Sulphur Study Site on Big Sulphur Creek (Source: Harding Lawson Associates, 1990)

was quantified and correlated with stream flow. Nursery habitat or rearing flows were also estimated by the above studies. They ranged from 20 cfs (Winzler and Kelly, 1978) to 80 cfs (Baracco, 1977). The higher flow estimate represents 20 percent of the annual average unimpaired flow.

Studies on Other North Coast Streams Due to the scarcity of information on fishery flows within the Russian River watershed, two additional instream flow studies were reviewed. These studies were conducted by the CDFG on Brush Creek in Mendocino County (Snider, 1985) and Lagunitas Creek in Marin County (Smith, 1986). Both of these studies used PHABSIM for determining what flows were required for steelhead and coho salmon within the creeks. These studies were selected because they dealt with coastal streams within the same general area as the Russian River.

Brush Creek The IFIM for Brush Creek was conducted using one study reach. Using the total weighted usable area curves for spawning, the study found that 50 cfs provided maximum spawning habitat for steelhead (Snider, 1985). Steelhead spawning flow needs were higher than those needed for coho salmon. Therefore, the flows for steelhead were used as the controlling factor for determining habitat suitability. Using the estimated runoff developed by Hecht, et al. (1983), these flows represent 114 percent of the average annual flow (44 cfs). The CDFG recommended a flow of 30 cfs for "optimum" spawning habitat in lower Brush Creek. This flow equated to providing 80 percent of the maximum steelhead spawning habitat and 98 percent of the maximum coho spawning habitat (Snider, 1985). The CDFG recommended optimum flow of 30 cfs, in this case, represents 68 percent of the average annual flow.

Lagunitas Creek The Lagunitas Creek IFIM study was conducted at four locations. The most upstream site was designated A and progressed alphabetically downstream to site D. There were marked differences between reaches, especially for coho. Coho spawning habitat is less abundant in reaches A and D, therefore, the habitat maximizes at much lower flows than in reaches B and C (Smith, 1986). Although D is the most downstream reach it was not used in this analysis because of the reduced spawning habitat. The next most downstream reach (Reach C) was selected for detailed comparison.

As was the case with Brush Creek, Lagunitas Creek exhibited different habitat requirements for steelhead and coho. Steelhead requires 50 cfs for optimum spawning while coho requires only 35 cfs. The higher and more controlling spawning flow of 50 cfs was used as the optimum flow requirement. This flow was compared to the average annual unimpaired flow (69 cfs) calculated at Taylor State Park (Smith, 1986). It represents 72 percent of the average annual unimpaired flow.

The IFIM did not evaluate juvenile rearing habitat for coho. Therefore, only the rearing habitat needs for steelhead were analyzed. The optimum rearing flow for Reach C was 35 cfs for steelhead. This represents 50 percent of the average annual unimpaired flow.

Conclusions Streams and rivers are dynamic systems. Therefore, generalizations are difficult to make. The above studies show high variability in the amount of streamflow needed for salmonid fisheries. Not only differences between species, but also differences between watersheds and along a single stream channel.

These studies estimated optimum spawning flows for coho and steelhead ranging from 68 to 114 percent of the average annual unimpaired flow. The higher 114 percent value is lowered to 68 percent if the "optimum" spawning habitat recommendations of the CDFG made for this stream are used. Optimum rearing habitat is attained with flows in the range of 20 to 50 percent of the average annual unimpaired flow (Table 4.1-1).

These results compare favorably with other standard-setting

Table 4.1-1: Fishery habitat flows as a percentage of average annual unimpaired flows.

Watershed	Optimal Spawning Flow (cfs)	Optimal Rearing Flow (cfs)	Average Annual Flow (cfs)	Spawning Flow as Percent of Average Annual Flow	Rearing Flow as Percent of Average Annual Flow
Big Sulphur	85	40	81	104%	49%
Dry Creek	400	80	399	100%	20%
Brush Creek IFIM	50	13	44	114%	29%
Brush Creek - CDFG recommended "optimum"	30	8	44	68%	18%
Lagunitas Creek	50	35	69	72%	50%

techniques. Tennant (1976) determined that providing 60 to 100 percent of the average annual flow would provide optimum habitat for fisheries. O'Shea (1995) examining the relation between stream discharge and wetted perimeter of Minnesota streams found that approximately 70 percent of the mean annual flow was needed for minimum instream flow requirements. It has also been suggested by Dr. Michael Healey that the uncertainty of what impacts may occur increases as flows drop below 70 percent of the natural flow (Centers for Water and Wildlands Resources, 1997).

The actual percentage of the hydrograph used to estimate needed bypass flows depends upon the level of protection being sought.

Section 5937 of the Fish and Game Code states, in part, that "(t)he owner of any dam shall allow sufficient water at all times to pass through a fishway, or in the absence of a fishway, allow sufficient water to pass over, around or through the dam, to keep in good condition any fish that may be planted or exist below the dam." The Fish and Game Code does not define what it means when it says in "good condition". While this code section specifically applies to CDFG's role with respect to dams, it also provides important legislative guidance that the SWRCB takes into consideration with respect to all diversions of water.

During the Mono Lake hearings before the SWRCB, Mr. Darrell Wong, Associate Biologist with the CDFG, provided the following definitions:

"The instream flows necessary to keep fish in good condition include those which will maintain a self-sustaining population of desirably-sized adult vertebrate fish which are in good physical condition, i.e. well proportioned and disease free. Fish populations should not be limited by lack of cover, food availability, poor water quality (including temperature), or lack of habitat necessary for reproduction. The fish populations should contain good numbers of different age classes; and habitats for these life stages should not be limiting. Therefore the 'good condition' requirement must include the protection and maintenance of the physical, biological, and chemical parameters which constitute the ecology of the stream. The ecological health of the stream will determine if fish, both vertebrates and invertebrates, are to be kept in good condition."

"Sufficient flows to keep fish in good condition are those resulting in adequate water depths, velocities, water quality (including temperature), and substrates required for the maintenance of aquatic life. Adequate instream flows are necessary throughout the entire stream reach to maintain aquatic populations throughout the year for all life stages, including eggs in or on the substrate. Water temperatures within the range for adequate growth and reproduction are required. Substrate with low imbeddedness due to minimal fine sediment deposition generally increases stream productivity and invertebrate habitat, and increases trout spawning success. Adequate water depth will provide holding cover, feeding areas, and provide overwinter habitat for trout. Adequate water velocities are required for spawning, sediment transport, food item transport, and to provide a diversity of aquatic habitats. All of these factors should result in good somatic growth of fish life."

An additional consideration for the level of protection required is the definition of "take" under the FESA. The FESA defines "take" to mean "harass, harm, pursue, hunt, shoot, wound, kill,

trap, capture, or collect, or to attempt to engage in any such conduct." The term "harm" is further defined to mean "an act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavior patterns, including breeding, feeding or sheltering" (50 CFR 17.3).

Decision 1631 (D-1631) established instream flow requirements for tributaries to Mono Lake to attain, at a minimum, good conditions for fish. The SWRCB determined that flows within the subject tributaries should provide 80 percent of the maximum WUA for dry years, 90 percent for normal years, and 100 percent for wet years. Since the Mono Lake tributaries are snow melt streams, they are not directly comparable to rain-fed coastal streams. However, criteria established for high and low flow periods should be comparable.

The flows established for Lee Vining Creek during the high flow period provide 55 percent of the average annual flow during dry years and 80 percent of the average annual flow during normal and wet years. On average, the minimum flows established during the high flow period in D-1631 provide 74 percent of the average annual flow. During the low flow period, the minimum flows provide 37 percent of the average annual flow in dry years and 60 percent of the average annual flow in normal and wet years. On average, the minimum flows during the low flow period provide 54 percent of the average annual flow.

Fish populations are usually under the most stress during dry years. Water availability analyses for water right purposes should use the dry year fish criteria and actual dry year flows to determine seasons of water availability. SWRCB staff is proposing to use the dry year criteria established in D-1631 as the criteria for the Russian River watershed. In a typical weighted usable area curve, 80 percent of the maximum WUA is provided by a flow of approximately 60 percent of the flow needed to provide 100 percent of the maximum WUA (Figure 4.1-2). For the studies evaluated, approximately 100 percent of the average annual flow provides optimum spawning habitat (Table 4.1-1). Therefore, 60 percent of the average annual flow should provide enough spawning habitat to keep fish in good condition under dry year conditions. Extrapolating this methodology to the low flow season, 50 percent of the average annual flow provide optimum rearing conditions (Table 4.1-1). Consequently, 30 percent of the average annual flow ($0.6[50\%]=30\%$) should provide good rearing conditions during dry years.

In view of the above information, SWRCB staff are proposing to establish a bypass flow requirement of 60 percent of the average annual unimpaired flow during the spawning season of salmonid species within the Russian River watershed. This level of flow

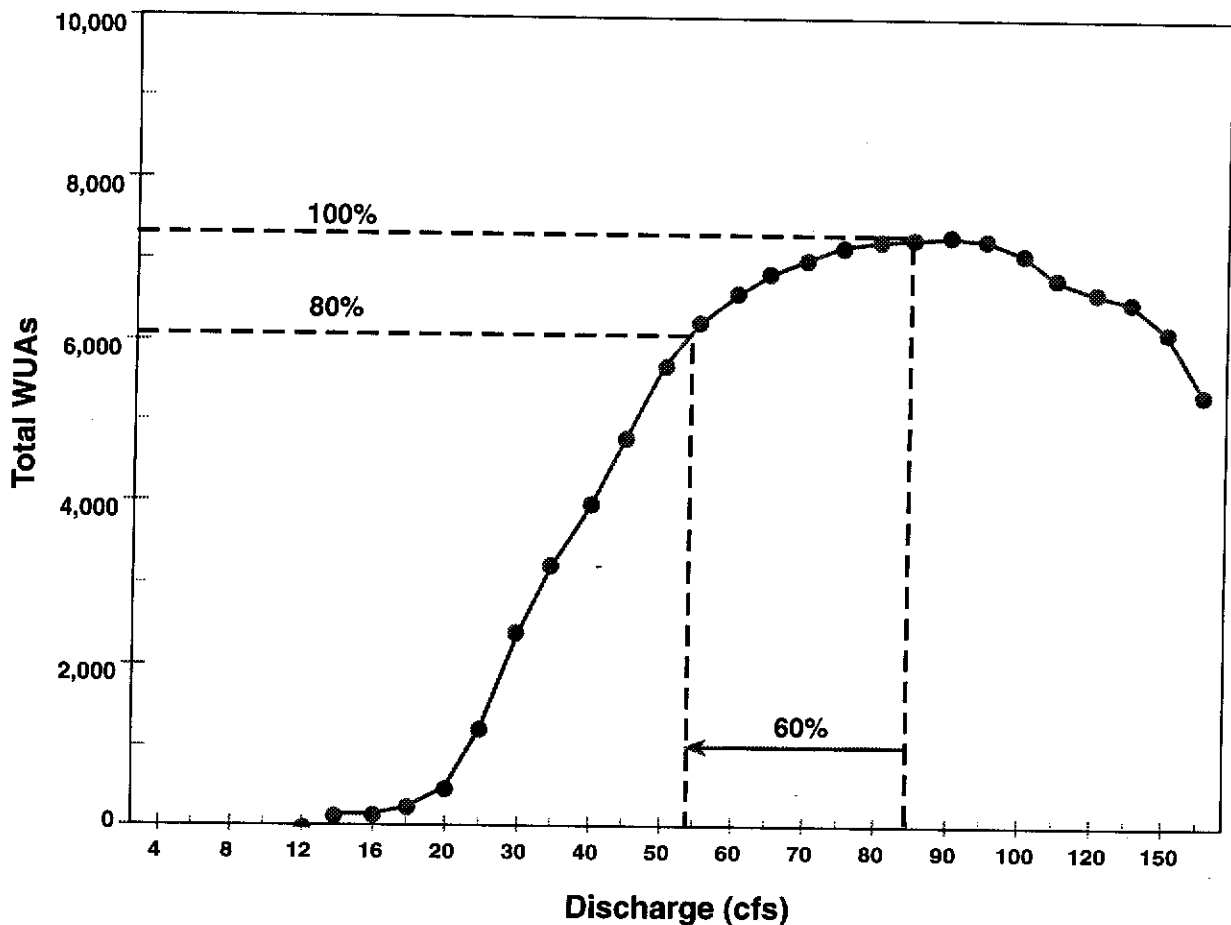


Figure 4.1-2: Total Weighted Usable Area for Spawning Habitat vs. Discharge for Big Sulphur Creek

should allow for the diversion of unappropriated water within the watershed without further impacting the fishery resources during the high flow period. This criteria is for dry year conditions and should be used with dry year hydrology to determine water availability. If only normal year hydrology is available, then a higher percentage should be used for fishery protection (perhaps 70 to 75 percent).

Late spring, summer, and fall rearing conditions are more problematic. The analysis of the available studies in or near the Russian River watershed suggest a range from 20 to 50 percent of the average annual flow provide for optimal rearing habitat (Table 4.1-1). "Good condition" flows for dry years are provided by 30 percent of the average annual flow. However, this flow rarely occurs during the spring, summer, or fall. Under natural conditions, flows that exist in the summer likely limit population the size of salmonid fisheries.

The results of this evaluation confirm the validity of using a simple percentage of the natural hydrology in obtaining a quick estimate of the flows needed for optimum habitat in the Russian River tributaries and perhaps other coastal areas in California. While such a method may be suitable for small projects and the development of flow bypass criteria, more detailed studies incorporating IFIM methodology should be used for larger projects and/or for determining minimum instream flows.

5.0 AUTHORIZED DIVERSION SEASON

An authorized season of diversion for new water projects depends on the hydrology and the needs for both instream uses and the prior rights of water users. Past decisions of the SWRCB have determined water availability for the main stem of the Russian River during the irrigation season. The tributary areas in the Russian River Watershed need to be evaluated to determine water availability.

5.1 Onset of Rains and Subsequent Runoff There are five USGS rainfall gauges within the Russian River watershed (Table 5.1-1), with periods of record ranging from 42 to 87 years. The average rainy season within the Russian River watershed can be determined by plotting the cumulative average rainfall over time (Figure 5.1-1). The inflection point where the curves begin season, around the middle of November. Where the curves begin to rise significantly indicates the beginning of the rainy season, around the middle of November. Where the curves begin to flatten out, or become horizontal, denotes the end of the rainy season. For the Russian River watershed, this generally occurs around the end of March. The same pattern, although on a smaller scale, is observed when data from only the below average water years are used (Figure 5.1-2). On average, the rainy season for the Russian River watershed is during the period from November 15 to March 31.

Table 5.1-1: Rain gauge stations within the Russian River watershed.

Station	Years of Record
Cloverdale	1950-1991
Graton	1948-1992
Healdsburg	1931-1992
Ukiah	1906-1992
Santa Rosa	1932-1992

There is normally a delay between the onset of rainfall and the subsequent runoff. Examination of rainfall and streamflow data shows that there is not a significant rise in runoff until

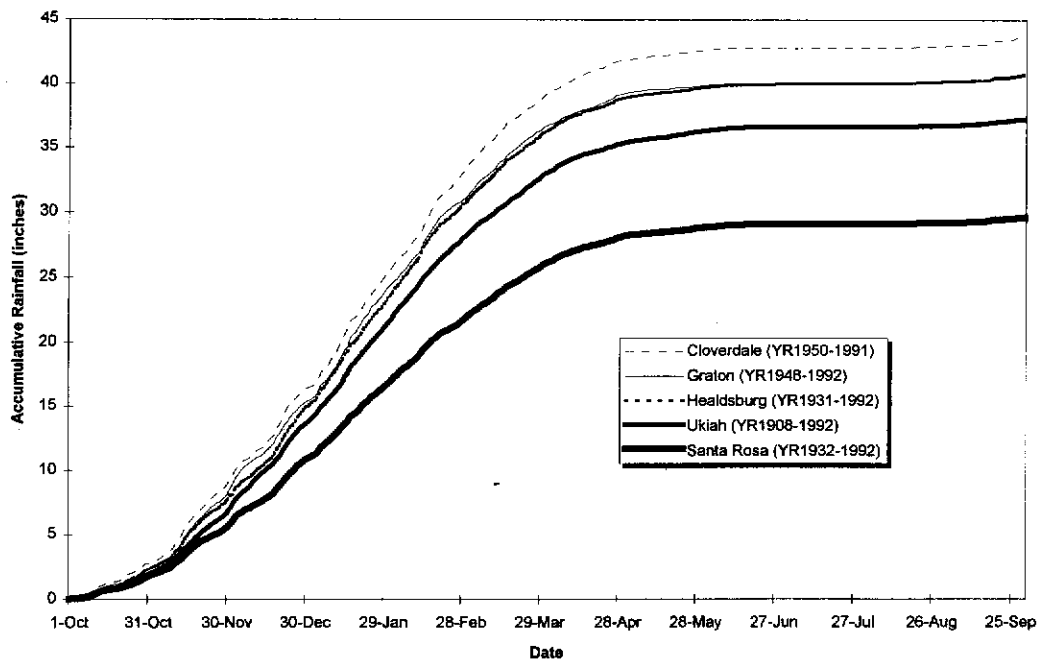


Figure 5.1-1: Accumulative Daily Rainfall Pattern Using Five Rainfall Stations in the Russian River Watershed

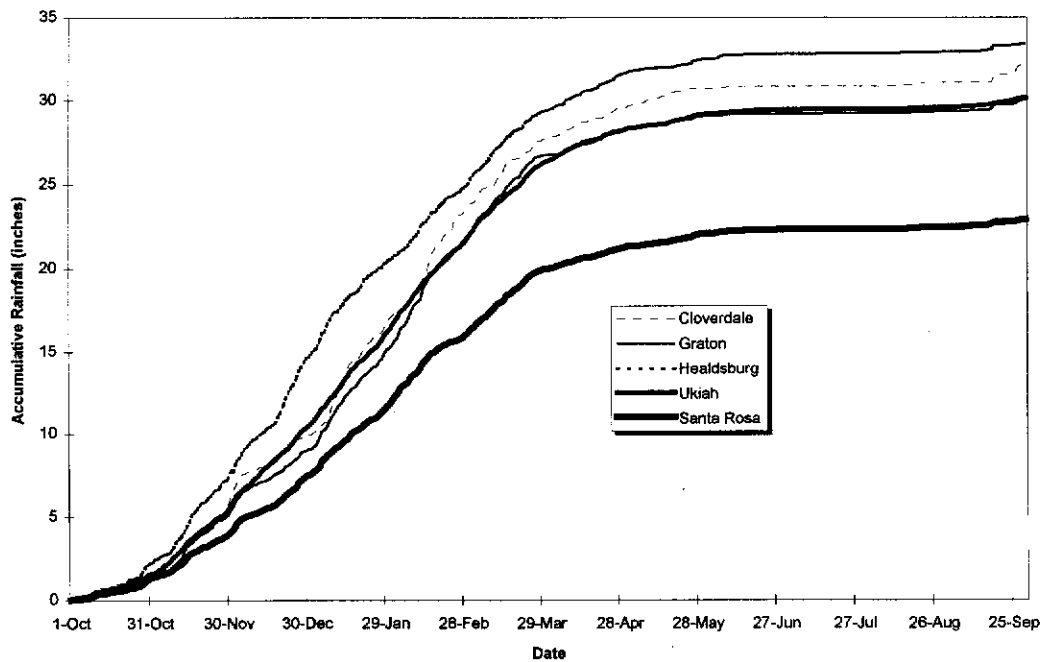


Figure 5.1-2: Accumulative Daily Rainfall Pattern Using Five Rainfall Stations (Below Average Data) in the Russian River Watershed

after several storm events have occurred. For a typical average year within the Russian River watershed, a significant rise in runoff occurs towards the end of November to the first part of December (Figure 5.1-1). During a typical dry year, this may not occur until January (Figure 5.1-2).

5.2 Tributaries Hydrographs for a sampling of Russian River tributaries were developed (Figures 5.2-1 through 5.2-4). Superimposed on these hydrographs are the flow criteria of 60 percent of annual average flow for November through April period (spawning) and 30 percent of average annual flow for the remainder of the year (rearing).

In the tributary areas summer rearing habitat is generally considered the limiting factor for coho and steelhead (W. Cox, pers. comm.). During the summer, rearing habitat for young coho and steelhead is at a premium due to naturally low flows and high water temperatures. Stream flows in the spring, summer and fall are not sufficient to provide good rearing conditions and only a small percentage of these flows currently exist (Figures 5.2-1 through 5.2-4). Further depletion of these limiting flows by new water diversions would not be appropriate in most cases. The only period when water may be available for further appropriation after the needs of fish are met is the wet weather period of mid November through April. However, water is typically not available above the needed spawning flows until December.

Early rains, and subsequent runoff are important for upstream migration (Sandercock, 1991; Shapovalov and Taft, 1954). Upstream migration for coho begins in November and extends until mid-January. In order to protect the early flows needed for adult salmonid upstream migrations, new water diversions should not begin until December 15.

Flows in March are typically above the criterion for spawning of 60 percent of the average annual flow. By April, flows are usually much less than this criterion. However, the timing of outmigration of young salmonids is more important in setting a diversion period. Smolt emigration may occur at any time conditions are satisfactory, but normally occurs from January through June (Trinity Associates, 1994; SEC, 1996; Sonoma County Water Agency, 1996). Shapovalov and Taft (1954) observed the outmigration of coho smolts peaking around mid-March. During dry years, which can be critical times for fish, flows needed for spawning typically do not occur in April. Therefore, mid to late March should mark the end of the diversion season for new water diversions for most of the tributaries in the Russian River watershed.

With the listing of coho and the potential listing of steelhead, limiting the diversion season to December 15 through March 31 would help prevent new diversions from affecting stream flows

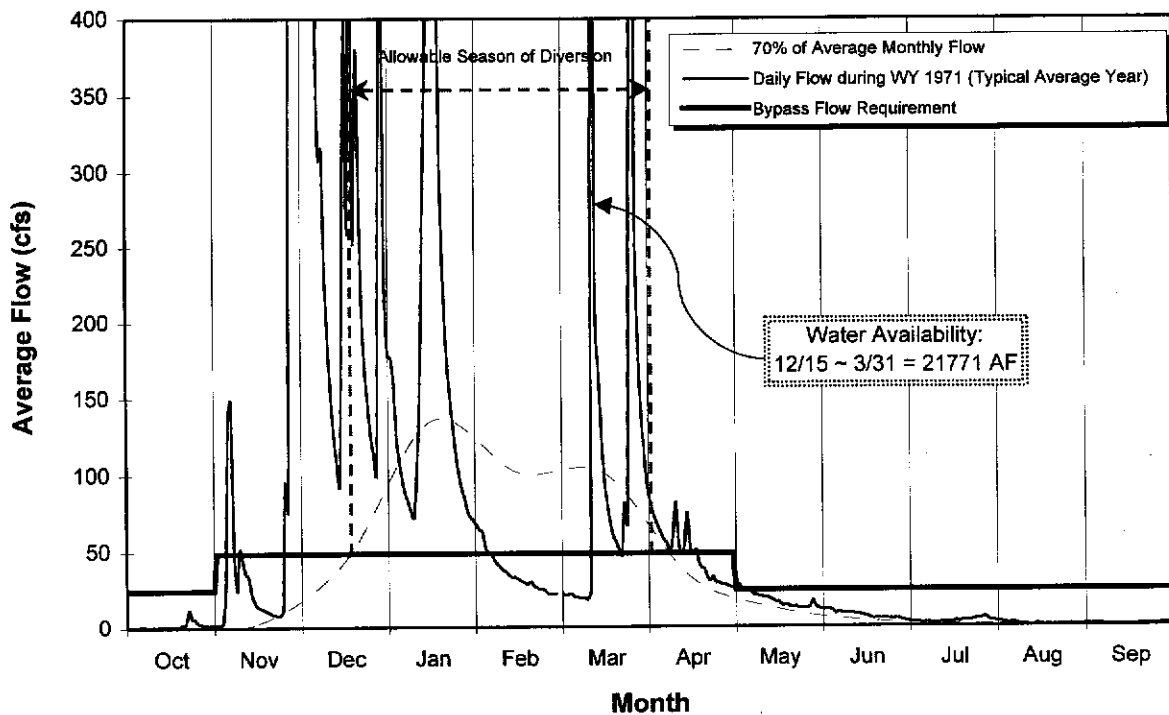
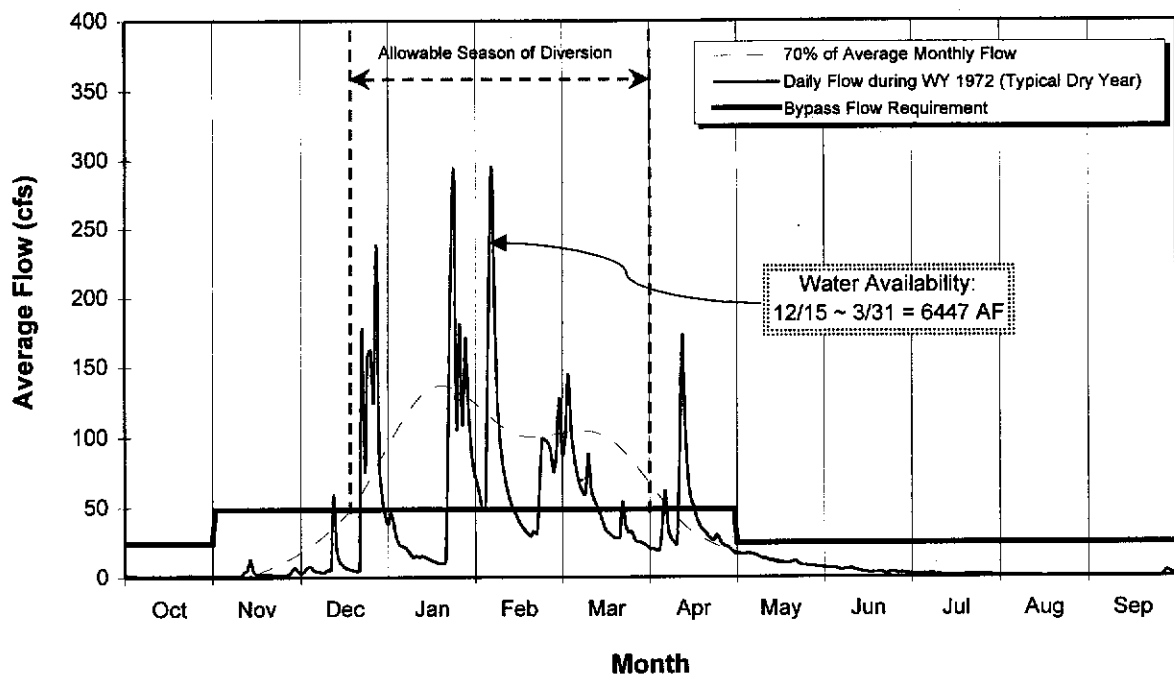


Figure 5.2-5: Proposed Season of Diversion and Bypass Requirements for Typical Dry and Average Water Year in Maacama Creek Watershed

needed by these species. This shortened diversion season will provide a level of protection for extant populations of coho and steelhead during upstream migration, spawning, and outmigration, as well as other fishery resources within the Russian River watershed (Figure 5.2-5). New diversions of water during the summer and fall months should not be allowed because existing flows are likely needed to protect existing populations of salmonid species currently in decline.

6.0 MAIN STEM OF THE RUSSIAN RIVER

Currently, Sonoma County Water Agency (SCWA) is required to meet instream flow standards as required by D-1610 and their water right permits. Stream flow in the upper portion of the river (East Fork below Coyote dam to Dry Creek) is regulated by releases from Lake Mendocino. Stream flows in Dry Creek below Warm Springs dam and in the lower river (from Dry Creek to the mouth) are regulated by releases from Lake Sonoma. Minimum instream flow requirements of D-1610 were established for normal, dry, and critical water years (Figure 6.0-1). Water year type is determined by the cumulative inflow to Lake Pillsbury on the Eel River, upstream of the Potter Valley diversion at Van Arsdale dam.

Coho and steelhead utilize the main stem of the river mainly for passage into and out of the watershed. These two species spawn and rear primarily in the tributaries. Some steelhead spawn and rear in Lower Dry Creek and in a reach of the Main Stem of the Russian River in Mendocino County.

Chinook spawn primarily in the main stem of the Russian River downstream of Coyote dam and also in Dry Creek.

American shad spawn in the main stem of the Russian River downstream of the Healdsburg dam. The Healdsburg dam blocks upstream migration during summer flows.

Approval of the pending water right applications on the main stem of the Russian River or on Dry creek below Warm Springs Dam is not likely to result in any new stream flow related impacts to these fisheries. Regardless of the number of new applications below Coyote or Warm Springs dams, the SCWA will still need to maintain the minimum flows established in D-1610. Determination of whether the D-1610 flows are adequate for the fisheries of the Russian River is beyond the scope of this analysis.² However,

²Sonoma County Water Agency, U.S. Army Corps of Engineers, and the National Marine Fisheries Service are in the process of initiating consultation under the federal Endangered Species Act. Flow and temperature regimes in the mainstem of the Russian River will likely be addressed during

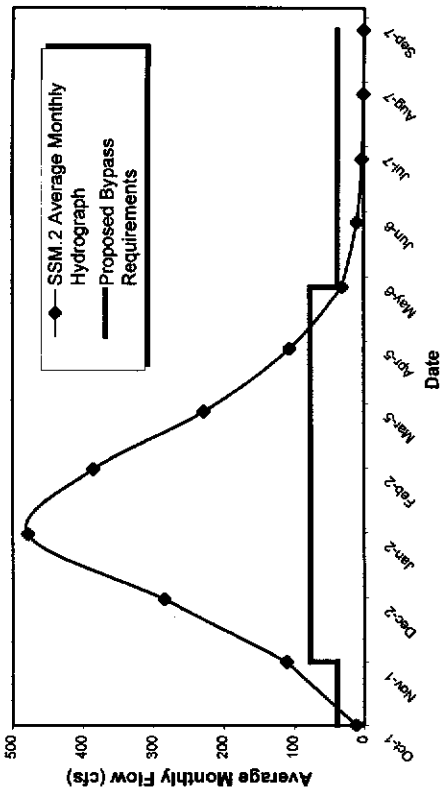


Figure 5.2-1: Average Monthly Hydrograph for Austin Creek Watershed with Proposed Bypass Requirements

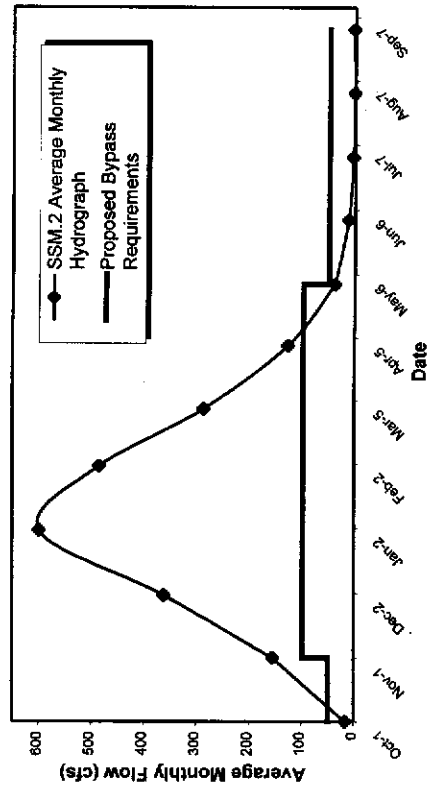


Figure 5.2-2: Average Monthly Hydrograph for Big Sulphur Creek Watershed with Proposed Bypass Requirements

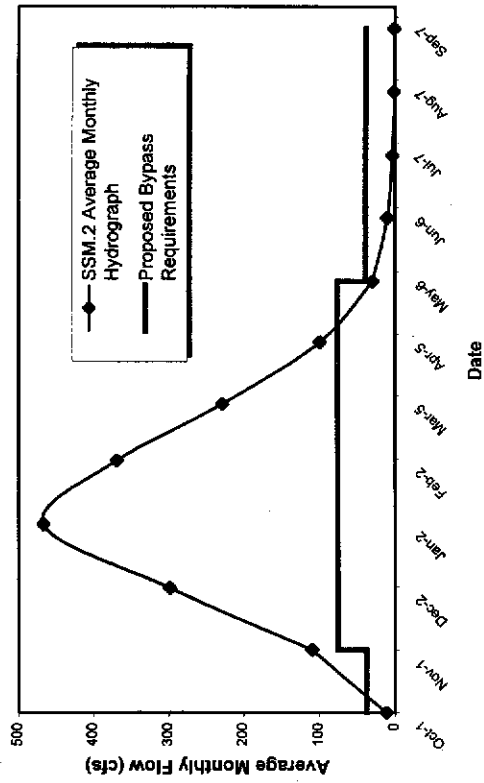


Figure 5.2-3: Average Monthly Hydrograph for Maacama Creek Watershed with Proposed Bypass Requirements

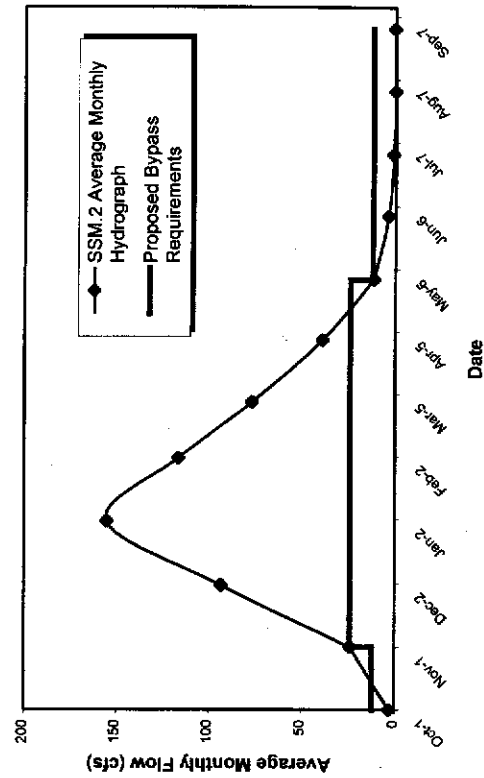


Figure 5.2-4: Average Monthly Hydrograph for Robinson Creek Watershed with Proposed Bypass Requirements

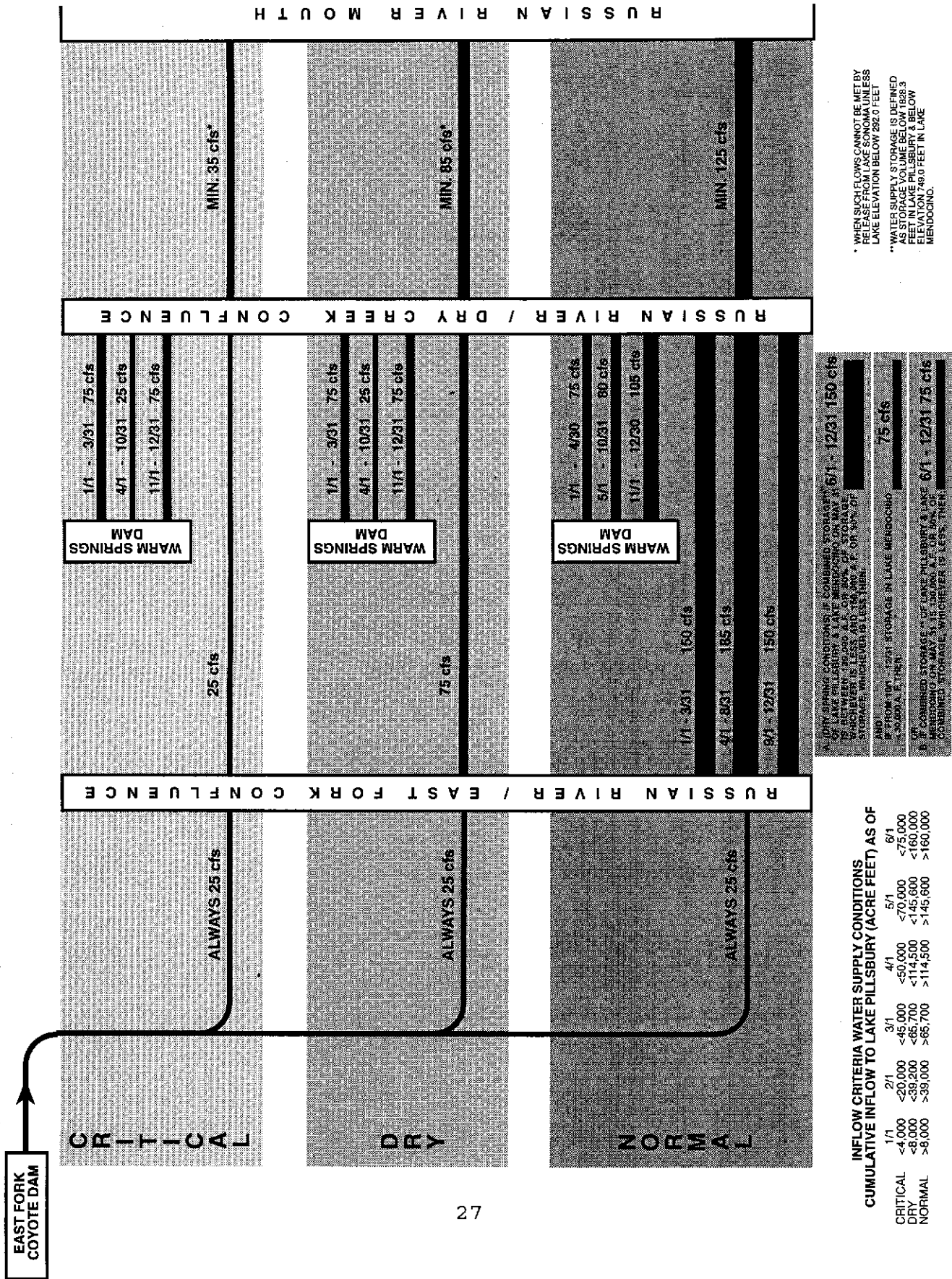


Figure 6.0-1 RUSSIAN RIVER BASIN STEAMFLOW REQUIREMENTS (Per State Water Resources Control Board Decision 1610, April 1986)

since minimum flows will need to be maintained, the SCWA will need to release more water from the reservoirs and there should be no new impacts on flow in the river due to the pending applications.

While the approval of new water rights will not change minimum stream flows in the Russian River, releasing more water will result in reservoir water levels dropping sooner and to a lower level each year. This may result in the loss of cold water storage and the increased likelihood that Basin Plan temperature objectives for the cold water fisheries will not be maintained. However, the SWRCB recognized that summer flow requirements may not be suitable for salmonid fisheries when rendering D-1610, as such, the SWRCB adopted a Statement of Overriding Considerations pursuant to the California Environmental Quality Act. This decision included the reservations initially provided in Decision 1030 (D-1030). There should be no new impacts to salmonid fisheries within the main stem of the Russian River due to summer flows or water temperatures that have not already been addressed in D-1610.

D-1030 established reservations of 8,000 AF and 10,000 AF of water for Mendocino and Sonoma Counties, respectively (see Appendix C of the *Russian River Watershed Staff Report*). These reservations were provided to allow some in basin diversion of project water to develop after the approval of Applications 12919A and 12920A. D-1030 established minimum instream flow requirements in the Russian River below Coyote Dam. During controlled flow periods, water rights issued under the reservations along the main stem of the river and above the flow measuring points do not alter the flow in the river. They simply require greater releases from Lake Mendocino.

Neither reservation has been depleted. Until the reservations are fully utilized, water is available for appropriation year-round from the Russian River downstream of Coyote Dam. Once the reservations are depleted, the diversion season established for tributaries above (December 15 to March 31) should be applied to new applications for water diversions from the Russian River.

7.0 OTHER FISHERIES ISSUES RELATED TO WATER DIVERSIONS

7.1 Onstream Reservoirs Onstream reservoirs can cause two problems: (1) blockage of fish movement both upstream and downstream; and, (2) capture of sediment which may cause the stream to incise and/or erode its banks downstream of the reservoir. Water right applications which request onstream storage may be required to alter the project to offstream storage if steelhead or coho will be prevented from migrating past the reservoir. Offstream storage may also be required if the

reservoir could significantly affect gravel recruitment downstream.

7.2 Pumping Facilities All new permits which utilize pumping facilities, either for direct diversion or diversion to offstream storage, should require the installation of fish screens or use offset wells to prevent entrainment of fish, except in cases where screens are clearly impractical or would not provide benefits to the fishery because the diversion is located outside the habitat area of fish populations. The NMFS and the CDFG have recently developed consistent fish screening criteria. These criteria are available and should be used for all new diversions that require screening.

7.3 Flushing Flows Periodic flows great enough to mobilize the bed of a stream are needed to remove fine sediments from spawning gravels. SWRCB staff are proposing that new appropriations of water use offstream storage. Since diverters normally do not begin pumping from a stream until after flows begin to decline following a storm, sufficient high flows should continue to occur within the streams to allow the flushing of fine sediments. To prevent a dramatic decline in flows when diverters begin pumping, SWRCB staff are proposing that new diversions within sub-watersheds of the Russian River be limited to a rate of diversion based on the size of the watershed. Allowing new diversions under the conditions proposed by staff should not significantly effect flushing flows within the Russian River tributaries.

8.0 LITERATURE CITED

- Baracco, A. 1977. Instream flow requirements in Dry Creek, Sonoma County, below Warm Springs Dam. California Department of Fish and Game. 34 pp.
- Bovee, K.D. 1982. A guide to stream habitat analysis using the instream flow incremental methodology. Instream Flow Information Paper 12. U.S.D.I., Fish and Wildlife Service, Office of Biological Services, Washington, D.C. xx + 8 pp.
- Brown, L.R., P.B. Moyle, and R.M. Yoshiyama. 1994. Historical decline and current status of coho salmon in California. North American Journal of Fisheries Management 14: 237-261.
- Centers for Water and Wildlands Resources. 1997. Transcript of workshop on flow standards, April 7, 1995, University of California, Davis. Water Resources Center, Report No. 89, University of California, Davis, California. iv + 64 pp.
- Groot, C., and L. Margolis. 1991. Pacific salmon life histories. University of British Columbia Press, Vancouver, British Columbia, Canada. xv + 564 pp.
- Harding Lawson Associates. 1990. Big Sulphur Creek Steelhead Trout Study, the Geysers, California. Novato, California. vii + 122 pp.
- Hardy, T.B., and S. Williamson. 1993. Using the computer based physical habitat simulation system (PHABSIM). U.S.D.I., Fish and Wildlife Service, National Ecology and Research Center, Fort Collins, Colorado. 144 pp.
- Hazel, C. 1976. In Burt, D.W. and Mundie, J. H. 1986. Case Histories of regulated streamflow and its effects on Salmonid populations. Canadian Technical Report of Fisheries and Aquatic Sciences No. 1477. 98 pp.
- Hecht, B., M. Woyshner, and H. Esmaili. 1983. Hydrology of the lower Brush Creek area, Mendocino County, California, preliminary assessment. HEA, J.H. Kleinfelder and Associates, Berkeley, California. iii + 110 pp.
- Kulik, B.H. 1990. A method to refine the New England aquatic base flow policy. Rivers 1(1):8-22.
- Moyle, P.B., R.M. Yoshiyama, J.E. Williams, and E.D. Wikramanayake. 1995. Fish species of special concern. California Department of Fish and Game, Rancho Cordova, California. iv + 272 pp.

National Marine Fisheries Service. 1996. West coast steelhead briefing package. National Oceanic and Atmospheric Administration, U.S. Department of Commerce. i + 26 pp.

Nelson, F.A. 1980. Evaluation of selected instream flow methods in Montana. Proceedings of the Annual Conference of the Western Association of Fish and Wildlife Agencies:412-432.

Sandercock, F.K. 1991. Life history of coho salmon (*Oncorhynchus kisutch*) (pp. 396-445). In Pacific salmon life histories (C. Groot and L. Margolis, eds.). University of British Columbia Press, Vancouver, British Columbia, Canada. xv + 564 pp.

Shapovalov, L., and A.C. Taft. 1954. The life histories of the steelhead rainbow trout (*Salmo gairdneri gairdneri*) and silver salmon (*Oncorhynchus kisutch*) with special reference to Waddell Creek, California, and recommendations regarding their management. Fish Bulletin No. 98, Department of Fish and Game, Sacramento, California. 379 pp.

Smith, G.E. 1986. Instream flow requirements, anadromous salmonids spawning and rearing, Lagunitas Creek, Marin County. Stream evaluation report 86-2, Department of Fish and Game, Sacramento, California. v + 40 pp.

Snider, W.M. 1985. Instream flow requirements of anadromous salmonids, Brush Creek, Mendocino County, California. Stream evaluation report 85-1, Department of Fish and Game, Sacramento, California. iii + 33 pp.

Sonoma County Water Agency. 1996. Water supply and transmission system project, draft environmental impact report, vol. 1. Santa Rosa, California. vii + 512 pp.

Stalnaker, C., B.L. Lamb, J. Henriksen, K. Bovee, and J. Bartholow. 1995. The Instream Flow Incremental Methodology: A primer for IFIM. Biological Report 29. U.S.D., National Biological Survey, Washington, D.C. vi + 45 pp.

Steiner Environmental Consulting. 1996. A history of the salmonid decline in the Russian River. Potter Valley, California. xii + 71 pp.

Tennant, D.L. 1976. Instream flow regimens for fish, wildlife, recreation and related environmental resources. Fisheries 1(4):6-10.

Trinity Associates, Inc. 1994. Status of steelhead populations in California in regards to the Endangered Species Act: background report prepared for Association of California Water Agencies - Russian River. Arcata, California. iii + 99 pp.

United State Army Corps of Engineers. 1982. Northern California streams investigation, Russian River basin study. Final Report. San Francisco, California. vii + 168 pp.

ATTACHMENT C

D-1030 RESERVATION EVALUATION

ATTACHMENT C

DECISION D-1030 - DEPLETION STUDY SUMMARY RUSSIAN RIVER MAINSTEM MENDOCINO AND SONOMA COUNTIES

1.0 INTRODUCTION

The purpose of this report is to evaluate the State Water Resources Control Board's (SWRCB) Decision D-1030's reservation depletions for the mainstem Russian River in Mendocino and Sonoma Counties. The following will provide a summary of D-1030 and an evaluation of D-1030's reservation depletion for each county, including a description of the methodology used to evaluate depletion, results of the depletion evaluation, and a summarized description of pending water right applications located on the mainstem Russian River that are affected by D-1030's reservation depletion.

2.0 DECISION D-1030, ORDER WR 73-15, ORDER WR 74-30

In 1949, the California Department of Finance filed water rights Applications 12919 and 12920 to appropriate water of the Russian River in furtherance of the Coyote Valley Project (i.e., Lake Mendocino).¹ The applications were for sufficient water to cover the ultimate capacity of the project as envisioned by the Corps of Engineers. On November 14, 1955, the applications to the extent of 122,500 afa and 335 cfs were partially assigned to the Sonoma County Flood Control and Water Conservation District (aka, Sonoma County Water Agency - SCWA) and designated as Applications 12919A and 12920A, to cover only the initial capacity of the reservoir created by the Coyote Valley Dam together with a proportionate share of the direct diversion amount. On December 20, 1956, the Sonoma County District executed a partial reassignment of a portion of Applications 12919A and 12920A to Mendocino County Russian River Flood Control and Water Conservation District (Mendocino County FCWCD).

In D-1030, the SWRCB found that it was in the public interest to protect all water uses supplied from the Russian River mainstem which existed at the time Applications 12919 and 12920 were filed in 1949. In addition, the SWRCB found that a reservation should be made for a "reasonable period of time" for a sufficient quantity of water to meet future requirements in Mendocino County and uses along the Russian River in Sonoma County. Although no time limit was specified by the SWRCB for use of Mendocino County's share of project water, the SWRCB initially defined as a "reasonable period of time", a 10-year time period within which water users along the Russian River within Sonoma County should exercise their preferred right to contract for project water, "after which time any water not contracted for should be made available for use elsewhere".

On August 17, 1961, the SWRCB ordered the conditional approval of Applications 12919A and 12920A. On October 24, 1961, Permits 12947

¹ Each application is for a permit to appropriate 200,000 afa by storage and 550 cfs by direct diversion from the East Fork Russian River for use in portions of Mendocino and Sonoma Counties.

and 12948 were issued to SCWA and Mendocino County FCWCD, and Permits 12949 and 12959 were issued to SCWA with the following conditions:²

"These permits are subject to rights acquired or to be acquired pursuant to applications by others whether heretofore or hereafter filed for use of water within the service area of Mendocino County Russian River Flood Control and Water Conservation Improvement District and within the Russian River Valley in Sonoma County, as said Valley is defined in Decision D-1030 of the State Water Rights Board on Page 9, to the extent that water has been beneficially used continuously on the place of use describe in said applications since prior to January 28, 1949 (the date of filing Applications 12919 and 12920)."

"The right to export water from the Russian River Valley under these permits is subject to depletion by consumptive use of project water appropriated under these permits of 8,000 acre-feet per annum for beneficial use in the service area of Mendocino County Russian River Flood Control and Water Conservation Improvement District."

"The right to export water from the Russian River Valley under these permits is subject to depletion by diversion of project water appropriated under these permits of not to exceed 10,000 acre-feet per annum for beneficial use within the Russian River Valley in Sonoma County, provided that agreements for the use of said project water are entered into with Sonoma County Flood Control and Water Conservation District prior to August 1, 1971."

Subsequent to the 1961 issuance of permits related to the Coyote Valley Dam Project, the SWRCB issued Orders WR 73-15 and 74-30 on March 15, 1973 and October 17, 1974, respectively. Order WR 73-15 required a hearing to be scheduled to afford the permittee an opportunity to provide the SWRCB with a status report of actions taken to comply with Decision D-1030.³ In Order WR 74-30, the SWRCB found that Permits 12949 and 12950 should be amended, Permits 12947 and 12948 should be revoked, and separate Permits, 12947A and 12947B should be issued to SCWA and Mendocino County FC&WCD, respectively. Order WR 74-30 also ordered, in part, the following:

"1. The water appropriated pursuant to Permit 12947A shall be limited to water of the East Fork Russian River which can be beneficially used for municipal, industrial, irrigation, domestic, and recreational purposes and shall not exceed a total of 92 cubic feet per second by direct diversion and 122,500 acre-feet per annum (afa) by storage from January 1 to December 31. The total amount stored in Lake Mendocino under this permit and Permit 12947B shall not exceed 122,500 afa. The water shall be used only at Lake Mendocino and within service areas of Sonoma County Water Agency, the North Marin County Water District, and Marin Municipal Water District."

² Permits 12947 and 12948 cover the same project and the same water, the only material difference being that Permit 1247 is for municipal, industrial, domestic and recreational uses and permit 12948 is for irrigation and domestic uses. Ibid., p 46.

³ D-1030 prohibited diversions for use by SCWA and Mendocino County FCWCD until a description of the location of points of diversion and a statement of the quantities of water to be diverted at each point were filed with the Board.

"1b. The water appropriated pursuant to Permit 12947B shall be limited to water of the East Fork Russian River which can be beneficially used for municipal, industrial, irrigation, domestic, and recreational purposes within the place of use authorized by Permits 12947 and 12948, in Mendocino County, and shall not exceed 53 cubic feet per second by direct diversion and 122,500 acre-feet per annum (afa) by storage from January 1 to December 31."

The total amount stored in Lake Mendocino under Permit 12947B and Permit 12947A shall not exceed 122,500 afa. The combined direct diversion and rediversion of stored water under Permit 12947B shall not exceed 8,000 afa."

"2. Total combined direct diversion and rediversion of stored water under Permits 12947A, 12949, and 12950 shall be limited to Wohler and Mirabel pumping plant facilities, and shall not exceed 92 cubic feet per second or a maximum amount of 37,544 acre-feet per water year of October 1 to September 30."

"11. This permit is subject to rights acquired or to be acquired pursuant to applications by others whether hertofore or hereafter filed for use of water within the service area of Mendocino County Russian River Flood Control and Water Conservation District and within the Russian River Valley in Sonoma County, as said valley is defined in Decision 1030 to the extent that water has been beneficially used continuously on the place of use described in said applications since prior to January 28, 1949 (the date of filing Application 12919 and 12920)."

"12. The right to export water from the Russian River Valley under Permit 12947 is subject to depletion by consumptive use of project water in the amount of 8,000 acre-feet per annum (afa) appropriated under Permit 12947B and depletion by diversion of project water not to exceed 10,000 afa appropriated under other permits which may be issued for agriculture and domestic purposes within the Russian River Valley in Sonoma County for uses commencing after January 28, 1949."

"18. Permittee (Permit 12947A - SCWA) shall release water from storage as required to meet the demands of junior appropriators not to exceed 10,000 acre-feet per annum, in Russian River Valley in Sonoma County, except to the extent that retention of stored water is necessary to insure satisfaction of the minimum streamflows required by this permit."

3.0 RESERVATION DEPLETION EVALUATION - MENDOCINO COUNTY

As indicated above, the right to export water from the Russian River Valley is subject to D-1030's "depletion by consumptive use" (emphasis added) of 8,000 afa of project water appropriated under Permit 12974B for beneficial use in the service area of Mendocino County FC&WCD. An evaluation of Decision D-1030's Mendocino County Reservation was conducted as part of the Division's Licensing and Hearing Section's July 7, 1992, licensing inspection of the District's use of water under Permit 12974B.

The inspecting engineer⁴ found that the maximum use of "project water" made under Permit 12947B by Mendocino County FC&WCD occurred in 1977

⁴ Harry O'Leary, inspecting engineer, July 7, 1992, "Report of Inspection (Appendix 1)".

(see Appendix 1). During this time, 5,124 acre-feet was withdrawn from storage for use by pre-1949 water right appropriators, 2,102 acre-feet was withdrawn from storage for use by post-1949 water right appropriators, and 965 acre-feet of post-1949 direct diversion occurred, for a total maximum annual use of 8,191 acre-feet. However, because D-1030 subjected Permit 12947B to the prior rights of pre-1949 users, the 5,124 acre-feet of withdrawn storage shall not count against the 8,000 acre-feet reservation. Consequently, there existed 4,933 acre-feet of project water available for appropriation under Mendocino County's reservation, more than enough to cover the total pending annual demand of 1,703 af.

There are 12 pending applications seeking appropriative rights to divert water from the Russian River mainstem in Mendocino County. The following Table 1 provides a summary of the pending applications.

TABLE 1
Summary of Pending Applications
Russian River Mainstem - Mendocino County

APPLICATION NUMBER	FILE DATE	APPLICANT	DIRECT DIVERSION (CFS)	STORAGE DEMAND (AF)	USE	SEASON	PROTESTED	PROTEST TYPE
A-29525	07/25/89	NELSON	1.92	0	I,N,L	6/1-9/15	NOT NOTICED	
A-29526	07/25/89	NELSON	3.0	0	I,N,L	3/1-5/15	NOT NOTICED	
A-29591	10/23/89	JOHNSON ORCHARDS	2.22	0	N	2/15-5/15	YES	E
A-29592	10/23/89	JOHNSON ORCHARDS	1.8 450 GPD	0	I D	4/15-10/15 1/1-12/31	YES	E
A-29760	06/11/90	BRUTOCAO VINEYARDS	2.95	158	I,N,L,F	3/15-6/30(D/D) 11/1-6/30(STO)	NOT NOTICED	
A-30036	11/21/91	JOHNSON ORCHARDS	8.58	0	N	2/15-5/15	YES	E
A-30161	07/16/92	MORENO & CO.	8.5	0	N	3/1-4/30	NOT NOTICED	
A-30162	07/16/92	THOMAS, ET AL	30.0	0	N	3/1-4/30	NOT NOTICED	
A-30163	07/16/92	THOMAS, ET AL	40.0	0	N	3/1-4/30	NOT NOTICED	
A-30170	08/04/92	THOMAS, ET AL	13.0	0	N	3/1-4/30	NOT NOTICED	
A-30553	07/01/96	MILOVINA BROTHERS	0	40	I,N,R,F	11/1-5/15	NOT NOTICED	
A-30554	07/01/96	MILOVINA BROTHERS	0	45	I,N,R,F	11/1-5/15	YES	E, I

NOTE: I-IRRIGATION, N-FROST PROTECTION, L-HEAT CONTROL, F-FIRE PROTECTION, D-DOMESTIC
PROTEST TYPE: E-ENVIRONMENTAL, I-INJURY TO VESTED RIGHT

APPENDIX 1

REPORT OF INSPECTION
BY HARRY O'LEARY
1992

STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD

DIVISION OF WATER RIGHTS

REPORT OF INSPECTION

ADDENDUM

FILING DATA

APPLICATION: 12919 BA FILING DATE: 1/28/49
NAME: Mendocino County Russian River Flood Control and
Water Conservation and Improvement District
ADDRESS: 425 Talmadge Road, Ukiah, CA 95482
SOURCE: East Fork Russian River tributary to Russian River COUNTY: Mendocino
T. OF DIV.: NE¼ of SW¼ Section 34, T16N, R12W, MDB&M
MOUNT: 53 cfs by direct diversion and 122,500 AFA by Storage
PURPOSE: Municipal, Industrial, Domestic, Irrigation and Recreational
SEASON: January 1 to December 31 PLACE OF USE/ACREAGE: 4096 acres

PERMIT NO.: 12947B DATE ISSUED: 1-21-75 EXPIRES: 12-1-85

Date of Inspection: July 7, 1992 Inspected by: Harry O'Leary
Accompanied by: Gary Akerstrom, Engineer
Persons Interviewed: Same
Telephone No.: 707-462-1961

RECOMMENDATION

License ☒ Extension ☐ to 19__ No Action ☐ Revoke ☐ Other ☐
Changes ☐ Corrections ☒ No Changes or Corrections ☐ Amount ☒
Owner ☐ Address ☐ Season ☐ Purpose ☐ Point of Diversion ☒ Place of Use ☒

Remarks (Explain basis for recommendation)

After discussions with division staff regarding input data and yearly limitation, I have revised my recommendation for licensing as follows:

- ♦ Direct diversion rate should be 12.7 cfs (Does not include Redwood Valley Use)
- ♦ Collection to Storage should be 82,800 AFA (Based on Water year instead of calendar year).
- ♦ No change in consumptive use of 8,000 AFA.

Note: Backup material attached.

SOURCE

Name: East Fork Russian River Who measures flow? USGS
Tributary to: Russian River
Flow at time of inspection: See gage records
Is supply natural flow: Partly Eel River River imports

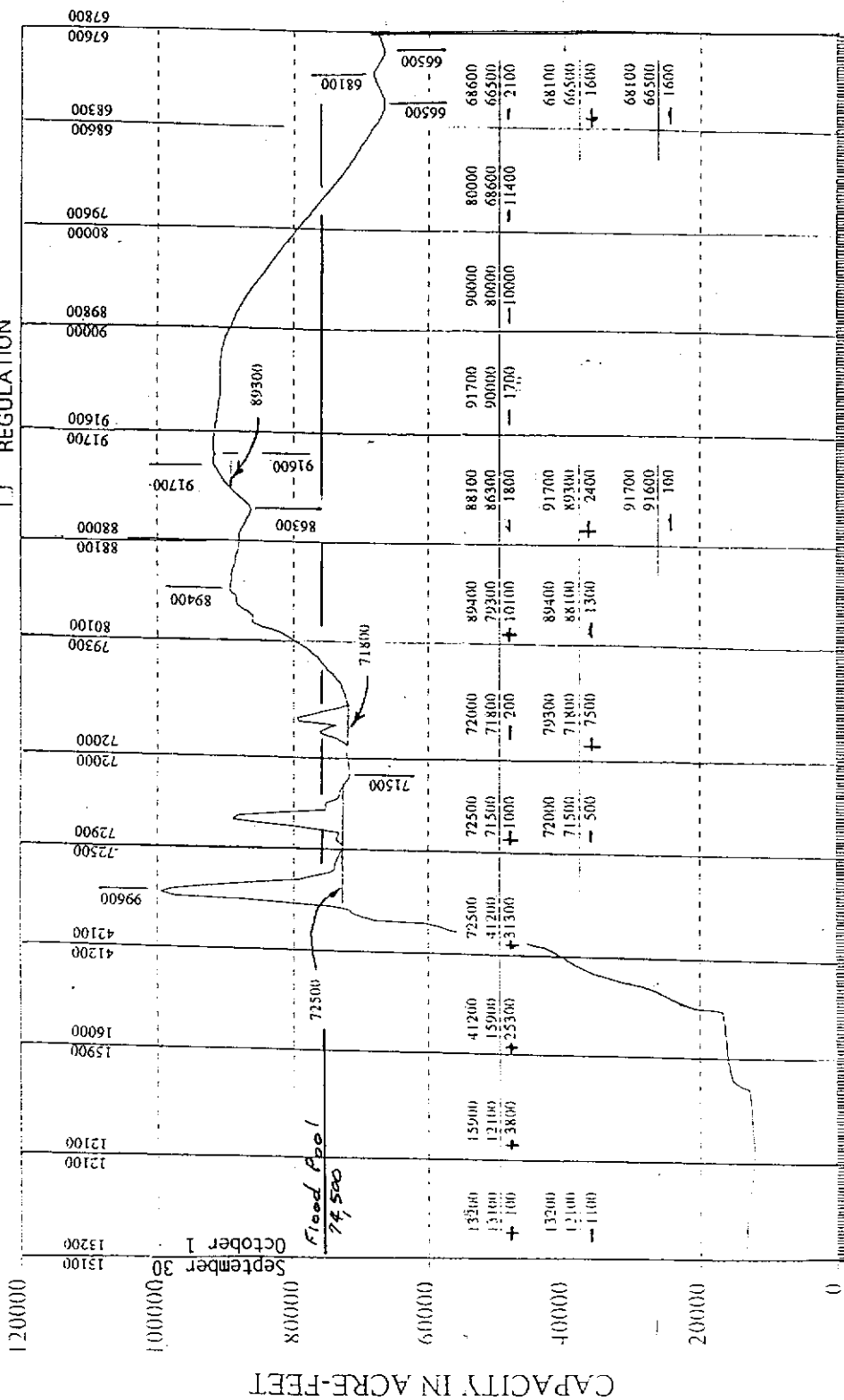
DIVERSION SYSTEM

California Coordinates, Zone N. E.

Is point of diversion at location specified in permit, license, or order? Yes
If not, is change petition/correction required? N/A
Describe present location: N/A
Would change cause any injury? N/A
Owner of land at point of diversion:
Assessor Parcel No.: Not obtained Type of access: Ownership
Is diversion system complete? Yes If not, what remains to be done? N/A

If not complete, does it appear to have been pursued with reasonable diligence? N/A
What is the capacity of the limiting section? Maximum held in storage, 114,800 AF: Jan 1970
How determined? See Engineer's map, under A-12919A and USGS Records.

HYDROGRAPHI



COLLECTION:	+100	+3800	+25300	+31300	+500	+7500	+10100	+2400	0	0	0	+1600	82,800
WITHDRAWAL	-1180	0	0	0	-1000	-200	-1300	-1900	-1700	-10000	-111400	-3700	32,300

WATER YEAR 1977-78

A B C D E F G H I J K L M N O P

COYOTE VALLEY DAM
DISTRIBUTION OF PROJECT WATER
1977

Month	Collection (Calc)	Withdrawal (Calc)	W Fork (USGS)	E Fork (USGS)	Inflow (Calc)	Pass Thru (DD) (Calc)	Pre-49 Use (Data)	Pre-49 DD EFork (Calc)W Fork (Calc)	Pre-49 DD Pass Thru (DD) (Calc)	Remaining Pass Thru (DD) (Calc)	Pre-49 Stor (Calc)	Available Storage	Post-49 Use (Data)	Post-49 DD (Calc)	Post-49 Stor (Calc)
JAN	3300	100	578	1270	4470	1270	179	0	0	179	0	100	47	47	0
FEB	700	200	798	992	1492	992	438	0	0	438	992	0	62	62	0
MAR	1900	0	2025	819	2719	819	580	0	0	580	819	0	33	33	0
APR	100	3000	283	3130	230	230	750	230	0	230	0	237	354	354	354
MAY	0	3900	196	5284	1384	1023	1023	837	0	196	557	0	316	316	0
JUN	0	9500	15	9856	356	356	1552	356	0	15	0	1181	428	428	0
JUL	0	12300	0	11252	0	0	2251	0	0	0	0	10049	665	665	665
AUG	0	9700	0	10401	701	701	2156	701	0	0	0	1455	321	321	0
SEP	100	3900	0	5518	1718	1718	1131	1131	0	0	587	0	166	166	0
OCT	100	1000	0	2603	1703	1703	584	584	0	0	1119	0	20	20	0
NOV	3800	0	2548	795	4595	795	209	0	0	209	795	0	0	0	0
DEC	25300	0	26250	428	25728	428	215	0	0	215	428	0	0	0	0
Totals	35300	43600					11068	3829				5124	3067	965	2102

Project Water: (Withdrawal + Direct Diversion)
 * Pre-49 from Storage = 5,124 AF * Withdrawn from storage by Pre-49 with permits
 Post-49 from Storage = 2,102 AF and licenses filed before and after 1-28-49.
 Post-49 DD = 965
 ** 8,191 AF (8,000 AFA reservation)
 ** Redwood Valley use not included
 Collection to Storage: 35,200 AFA
 Rate of Diversion: (30-day average):
 (From table above) $\bar{Q} = 321 \text{ AF/30 days} / (1.9835 \times 30) = 5.39 \text{ cfs}$ (53 cfs allowable)

1978-79

Month	Collection (Calc)	Withdrawal (Calc)	W Fork (USGS)	E Fork (USGS)	Inflow (Calc)	Pass Thru (DD) (Calc)	Pre-49 Use (Data)	Pre-49 DD EFork (Calc)W Fork (Calc)	Pre-49 DD Pass Thru (DD) (Calc)	Remaining Pass Thru (DD) (Calc)	Pre-49 Stor (Calc)	Available Storage	Post-49 Use (Data)	Post-49 DD (Calc)	Post-49 Stor (Calc)
OCT	4600	300	959	9530	13830	9530	391	0	0	391	9530	0	245	245	0
NOV	5900	200	31770	22270	27970	22270	188	0	0	188	22270	0	207	207	0
DEC	0	3100	56350	63090	59990	59990	107	0	0	107	59990	0	102	102	0
JAN	4200	0	35610	52410	56610	52410	218	0	0	218	52410	0	73	73	0
FEB	1500	0	35600	52300	53800	52300	187	0	0	187	52300	0	70	70	0
MAR	9800	0	27030	32600	42400	32600	240	0	0	240	32600	0	79	79	0
APR	7500	100	37090	61050	68450	61050	285	0	0	285	61050	0	114	114	0
MAY	400	1700	2630	18350	17050	17050	787	0	0	787	17050	0	149	149	0
JUN	0	4900	155	16840	11940	11940	1613	1458	0	155	10482	0	577	577	0
JUL	0	10600	260	13610	3010	3010	1632	260	0	1372	1632	0	780	780	0
AUG	0	1000	35	19100	18100	18100	1295	1260	0	35	16840	0	773	773	0
SEP	900	0	1500	68	13450	13450	980	912	0	68	12538	0	485	485	0
Totals	34800	23400					7923	5002				0	3654	3654	0

Project Water: (Withdrawal + Direct Diversion)
 * Pre-49 from Storage = 0 AF
 Post-49 from Storage = 0 AF
 Post-49 DD = 3,654 AF
 ** 3,654 AFA (8,000 AFA reservation)
 ** Redwood Valley use not included
 Collection to Storage: 34,800 AFA
 Rate of Diversion: (30-day average):
 (From table above) $\bar{Q} = 780 \text{ AF/31 days} (1.9835 \times 31) = 12.68 \text{ cfs}$ (53 cfs allowable)

A B C D E F G H I J K L M N O P

COYOTE VALLEY DAM
DISTRIBUTION OF PROJECT WATER

1977-78

Month	Collection (Calc)	Withdrawal (Calc)	W Fork (USGS)	E Fork (USGS)	Inflow (Calc)	Pass Thru (DD) (Calc)	Pre-49 Use (Data)	Pre-49 DD EFork (Calc) W Fork (Calc)	Pre-49 DD Pass Thru (DD)	Remaining Pass Thru (DD)	Pre-49 Stor (Calc)	Available Storage	Post-49 Use (Data)	Post-49 DD (Calc)	Post-49 Stor (Calc)
OCT	100	1100	0	2600	1600	1600	179	0	179	1600	0	1100	47	47	0
NOV	3800	0	2570	795	4595	795	438	0	438	795	0	0	62	62	0
DEC	25300	0	26550	428	25728	428	580	0	580	428	0	0	33	33	0
JAN	31300	0	72420	53450	84750	53450	750	0	750	53450	0	0	354	354	0
FEB	300	1000	41070	57470	56770	56770	1023	0	1023	56770	0	1000	316	316	0
MAR	7500	0	27640	37500	45000	37500	1552	0	1552	37500	0	0	428	428	0
APR	10100	1300	15380	27000	35800	27000	2251	401	1850	26599	0	1300	665	665	0
MAY	2400	1900	1850	17300	17800	17300	2156	1713	443	15587	0	1900	655	655	0
JUN	0	1700	443	16690	14990	14990	1131	1019	112	13971	0	1700	321	321	0
JUL	0	10000	112	16220	6220	6220	584	584	0	5636	0	10000	166	166	0
AUG	0	11400	0	18180	6780	6780	209	165	44	6615	0	11400	20	20	0
SEP	1800	3700	44	12300	10400	10400	215	171	44	10229	0	3700	0	0	0
Totals	82600	32100					11068	4053					3067	3067	0

Project Water: (Withdrawal + Direct Diversion)

* Pre-49 from Storage = 0 AF
Post-49 from Storage = 0 AF
Post-49 DD = 3067

* Withdrawn from storage by Pre-49 with permits and licenses filed before and after 1-28-49.

3,067 AFA (3,000 AFA reservation)

Collection to Storage: 82,600 AFA

Rate of Diversion: (30-day average):
(From table above)

$$\bar{Q} = 665 \text{ AF/30 days} / (1.9835 \times 30) = 11.17 \text{ cfs} \quad (53 \text{ cfs allowable})$$

CELL FORMULAE:

Month	A	B	C	D	E	F	G	H	I	J
See Hydrograph										
See Hydrograph										
USGS GAGE 1146100										
USGS GAGE 11462100										
@IF(B-C+E>0,B-C+E,0)										
@IF(E<H,E,F)										
MCFCD Water Consump. Data sheet										
@IF(H-J<=0,H-J,@IF(H-J<G,H-J,G-H+J))										
@IF(H<=D,H,D)										

K G-J

L @IF(H-I-J<=0,H-I-J)

M C-L

N MCFCD Water Consump. Data sheet

O @IF(K-N>0,K-N,0)

P @IF(N>0,@IF(M>0,N,0),0)

A B C D E F G H I J K L M N O P

COYOTE VALLEY DAM DISTRIBUTION OF PROJECT WATER

1977

Month	Collection (Calc)	Withdrawal (Calc)	W Fork (USGS)	E Fork (USGS)	Inflow (Calc)	Pass Thru (DD) (Calc)	Pre-49 Use (Data)	Pre-49 DD EFork (Calc) WFork (Calc)	Remaining Pass Thru (DD)	Pre-49 Stor (Calc)	Available Storage	Post-49 Use (Data)	Post-49 DD (Calc)	Post-49 Stor (Calc)
JAN 1977	3300	100	578	1270	4470	1270	179	0	179	0	100	47	47	0
FEB	700	200	798	992	1492	992	438	0	438	0	200	62	62	0
MAR	1900	700	2025	819	2719	819	580	0	580	0	0	33	33	0
APR	100	3000	283	3130	230	230	750	230	283	237	2763	354	354	354
MAY	0	3900	196	5284	1384	1384	1023	827	196	557	3900	316	316	0
JUN	0	9500	15	9856	356	356	1552	356	15	0	8319	428	428	428
JUL	0	12300	0	11252	0	0	2251	0	0	0	10049	665	665	665
AUG	0	9700	0	10401	701	701	2156	701	0	0	8245	655	655	655
SEP	100	3900	0	5518	1718	1718	1131	1131	587	0	3900	321	321	0
OCT	100	1000	0	2603	1703	1703	584	584	1119	0	1000	166	166	0
NOV	3800	0	2548	795	4595	795	209	209	795	0	0	20	20	0
DEC	25300	0	26250	428	25728	428	215	0	428	0	0	0	0	0
Totals	35300	43600					11068	3829		5124		3067	963	2102

Project Water: (Withdrawal + Direct Diversion)

* Pre-49 from Storage = 5,124 AF
Post-49 from Storage = 2,102 AF
Post-49 DD = 965

8,191 AFA (8,000 AFA reservation)

Collection to Storage: 35,200 AFA

Rate of Diversion: (30-day average):

(From table above) $\bar{Q} = 312 \text{ AF/30 days} / (1.9835 \times 30) = 5.24 \text{ cfs}$ (53 cfs allowable)

CELL FORMULAE:

A Month
B Sec Hydrograph
C Sec Hydrograph
D USGS GAGE 1146100
E USGS GAGE 11462100
F @IF(B-C+E>0,B-C+E,0)
G @IF(B-C+E>0,B-C+E,0)
H MCFCD Water Consump. Data sheet
I @IF(H-J<0,0,@IF(G)=H-J,H-J,G)
J @IF(H-J<0,0,H-J,D)

1981-82

Month	Collection (Calc)	Withdrawal (Calc)	W Fork (USGS)	E Fork (USGS)	Inflow (Calc)	Pass Thru (DD) (Calc)	Pre-49 Use (Data)	Pre-49 DD EFork (Calc) WFork (Calc)	Remaining Pass Thru (DD)	Pre-49 Stor (Calc)	Available Storage	Post-49 Use (Data)	Post-49 DD (Calc)	Post-49 Stor (Calc)
OCT 1981	9500	0	959	9530	19030	9530	391	0	391	0	0	138	138	0
NOV	22800	0	31770	22270	45070	22270	188	0	188	0	0	79	79	0
DEC	0	0	56350	63090	63090	63090	107	0	107	0	0	70	70	0
JAN 1982	100	800	35610	52410	51710	51710	218	0	218	0	800	93	93	0
FEB	700	0	35600	52300	55000	52300	187	0	187	0	0	94	94	0
MAR	14400	0	27030	32600	47000	32600	240	0	240	0	0	106	106	0
APR	3100	400	37090	61050	63750	61050	285	0	285	0	400	151	151	0
MAY	2500	1000	2630	18350	19850	18350	787	0	787	0	1000	364	364	0
JUN	0	500	155	16840	16340	16340	1613	1458	155	14882	500	845	845	0
JUL	0	6800	260	13610	6810	6810	1632	1372	260	5438	6800	1005	1005	0
AUG	0	11800	35	19100	7300	7300	1295	1260	35	6040	11800	979	979	0
SEP	3300	2900	68	14050	14450	14050	912	912	68	13138	2900	512	512	0
Totals	36400	24200					7923	5002		0		4436	4436	0

Project Water: (Withdrawal + Direct Diversion)

* Pre-49 from Storage = 0 AF
Post-49 from Storage = 4,436 AF
Post-49 DD = 0

4,436 AFA (8,000 AFA reservation)

Collection to Storage: 56,400 AFA

Rate of Diversion: (30-day average):

(From table above) $\bar{Q} = 1,005 \text{ AF/31 days} / (1.9835 \times 30) = 16.34 \text{ cfs}$ (53 cfs allowable)

A B C D E F G H I J K L M N O P Q R S
 1
 2
 3
 4
 5
 6
 7
 8
 9
 10
 11
 12
 13
 14
 15
 16
 17
 18
 19
 20
 21
 22
 23
 24
 25
 26
 27
 28
 29
 30
 31
 32
 33
 34
 35
 36
 37
 38
 39
 40
 41
 42
 43
 44
 45
 46
 47
 48

COYOTE VALLEY DAM
DISTRIBUTION OF PROJECT WATER

Month	Collection (Cals)	Withdrawal (Cals)	W Fork (USGS)	E Fork (USGS)	Inflow (Cals)	Pass Thru (DD) (Cals)	Pre-49 Use (Data)	Pre-49 DD (Cals)	W Fork DD	Remaining Pass Thru (DD) (Cals)	Pre-49 Stor (Cals)	Fish Bypass ** (21 cfs)	Fish Pass Thru (DD) (Cals)	Available Pass Thru (DD) (Cals)	Available Storage	Post-49 Use (Data)	Post-49 DD (Cals)	Post-49 Stor (Cals)
JAN 1977	3300	100	578	1270	4470	1270	179	0	0	179	0	1537	1270	0	0	0	47	0
FEB	700	200	798	992	1492	992	438	0	0	438	0	1388	992	0	0	0	62	0
MAR	1900	0	2055	819	2719	819	580	0	0	580	0	1377	819	0	0	0	31	0
APR	100	3000	283	3130	230	230	283	0	0	283	0	1488	230	0	1275	354	0	354
MAY	0	3900	196	5284	1384	1384	827	0	0	827	0	1537	557	0	2920	316	0	316
JUN	0	9500	15	9856	356	356	15	0	0	15	0	1488	0	0	6311	418	0	428
JUL	0	12100	0	11252	0	0	2251	0	0	0	0	1537	0	0	8312	665	0	665
AUG	0	9700	0	10401	701	701	2156	0	0	0	0	1537	0	0	6708	321	0	321
SEP	100	3900	0	5518	1718	1718	1131	0	0	587	0	1488	587	0	2999	166	0	166
OCT	0	1500	0	2603	1603	1603	584	0	0	1019	0	1537	1019	0	482	70	0	70
NOV	3800	0	2548	795	4395	795	209	0	0	795	0	1488	795	0	0	0	0	0
DEC	25100	0	26250	428	25728	428	215	0	0	428	0	1537	428	0	0	0	0	0
Totals	33200	43600					11068	3829			5124					3067		2903

Project Water:

* Pre-49 from Storage = 5,134 AF
 Post-49 from Storage = 2,905 AF
 Post-49 DD = 0
 Total = 8,039 AFA

* Withdrawn from storage by Pre-49 users with permits
 and licenses filed before and after 1-28-49.

CELL FORMULAE:

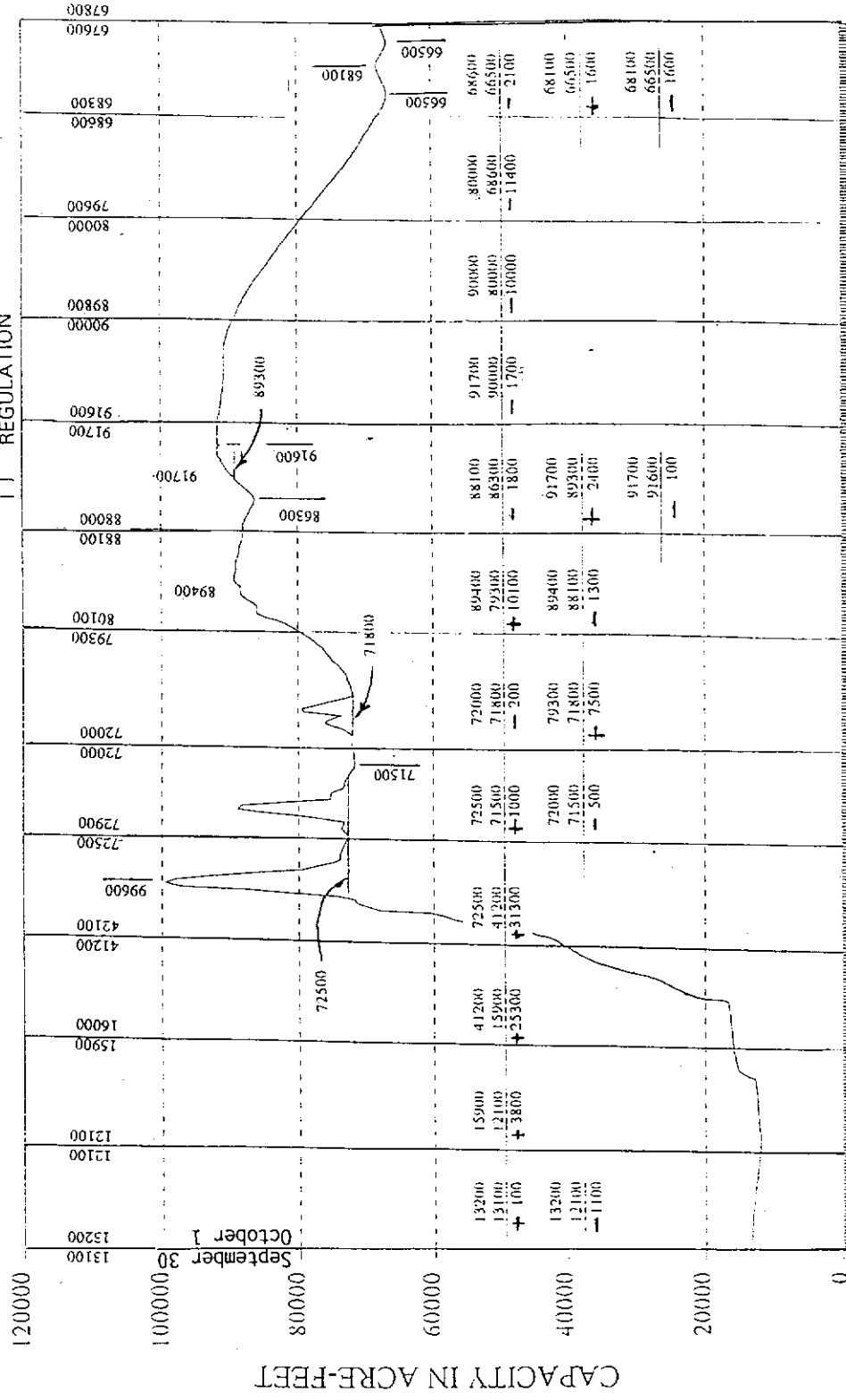
A Month
 B See Hydrograph
 C See Hydrograph
 D USGS Gage 11461000
 E USGS Gage 11462000
 F USGS Gage 11462000
 G USGS Gage 11462000
 H USGS Gage 11462000
 I USGS Gage 11462000
 J USGS Gage 11462000
 K @F(Q-0.0,G-0)
 L @F(Q-0.0,G-0)
 M -- 15 cfs X 1.98 X 31
 N @F(Q-0.0,G-0)
 O @F(Q-0.0,G-0)
 P @F(Q-0.0,G-0)
 Q MCTCD Water Consump. Data sheet
 R MCTCD Water Consump. Data sheet
 S @F(Q-0.0,G-0)
 ** Fish Bypass Depends on Dry, Normal, Critical Year

Month	Collection (Cals)	Withdrawal (Cals)	W Fork (USGS)	E Fork (USGS)	Inflow (Cals)	Pass Thru (DD) (Cals)	Pre-49 Use (Data)	Pre-49 DD (Cals)	W Fork DD	Remaining Pass Thru (DD) (Cals)	Pre-49 Stor (Cals)	Fish Bypass ** (50 cfs)	Fish Pass Thru (DD) (Cals)	Available Pass Thru (DD) (Cals)	Available Storage	Post-49 Use (Data)	Post-49 DD (Cals)	Post-49 Stor (Cals)
OCT 1981	9500	0	959	9330	19030	9330	391	0	0	391	0	9223	9223	0	0	0	138	0
NOV	22800	0	31770	22270	45070	22270	188	0	0	188	0	8926	8926	0	0	0	79	0
DEC	0	0	36350	63090	63090	63090	107	0	0	107	0	9223	9223	0	0	0	70	0
JAN 1982	100	800	35610	52410	51710	51710	218	0	0	218	0	9223	9223	0	800	0	93	0
FEB	700	0	35600	52300	53000	53000	187	0	0	187	0	9223	9223	0	0	0	94	0
MAR	14000	0	27030	32600	47000	32600	240	0	0	240	0	9223	9223	0	0	0	106	0
APR	3100	400	37090	61050	63750	61050	285	0	0	285	0	8926	8926	0	400	0	151	0
MAY	2500	1000	2650	18350	19850	18350	787	0	0	787	0	9223	9223	0	1000	0	151	0
JUN	0	500	135	16840	16340	16340	1613	0	0	1613	0	8926	8926	0	500	0	151	0
JUL	0	6800	260	13610	6810	6810	1632	0	0	1632	0	9223	9223	0	6800	0	151	0
AUG	0	11800	35	19100	7300	7300	1295	0	0	1295	0	8926	8926	0	3051	0	1005	0
SEP	3300	3900	68	14050	14450	14050	980	0	0	980	0	9223	9223	0	8914	0	312	0
Totals	54000	24200					7923	5002			0					4236		2152

LAKE MENDOCINO

HYDROGRAPH

☐ COLLECTION
☐ WITHDRAWAL
☒ REGULATION



COLLECTION:	+100	+3800	+25300	+31300	+500	+7500	+10100	+2400	-1700	0	0	0	+1600	82800
WITHDRAWAL:	-100	0	0	0	-1000	-200	-1500	-100	-10000	-11400	-3700			32300

WATER YEAR 1977-78

4.0 RESERVATION DEPLETION EVALUATION - SONOMA COUNTY

As noted above, the right to export water from the Russian River Valley under water right Permit 12974A, owned by Sonoma County Water Agency, is subject to D-1030's "depletion by diversion" (emphasis added) not to exceed 10,000 acre-feet of project water appropriated under the permit for beneficial use within the Russian River Valley in Sonoma County. Because the SWRCB found in related decisions that, during the four-month period of July 1 to October 31, there is insufficient flow in the Russian River to allow further appropriation, the water demand for this four month period is the water demand chargeable against the 10,000 acre-feet reservation. During this period of the year and prior to the 1982 construction of Warm Springs Dam (i.e., Lake Sonoma), the flow in the Russian River was totally controlled by releases of water stored in Lake Mendocino, and portions of the 10,000 acre-feet reservation are released as needed for use by Sonoma County water users.

4.1 Methodology

4.1.1 Pre-1949 Use Determinations The 10,000 acre-feet reservation specified in Decision D-1030 and WR 74-30 contained the stipulation regarding pre-1949 usage made within places of use described under water right applications filed after January 28, 1949, the date of filing of Applications 12919 and 12920. The determination of pre-1949 uses was based on the following two approaches:

1. Division staff conducted depletion studies in 1975, 1978, 1979, and 1982.⁵ These studies, which include consideration of applications filed during the period 1949 through 1982, used the following methodology to determine pre-1949 usage:
 - a. Comparing pre-1949 use areas established by examination of aerial photography (1952-1953), with places of use described under submitted applications; and
 - b. Relying on information provided by submitted applications (i.e., if information was found in the submitted applications indicating that water was used on all or a portion of the place of use prior to 1949, the information was assumed to be correct).
2. For applications filed during the period 1983 to the present, pre-1949 use was determined by:
 - a. Relying on information provided by submitted applications (i.e., if information was found in the submitted applications indicating that water was used on all or a portion of the place of use prior to 1949, the information was assumed to be correct).

⁵ SWRCB File 050.10 - Memorandums dated March 8, 1978, April 5, 1979, and October 7, 1982.

- b. Maximum use specified in submitted applications was used to derive average monthly demand for depletion evaluation purposes.

Under both approaches, if all or portions of the application's place of use was established as being within photographed or described pre-1949 use areas, the appropriate percentage of area would be used to determine the equivalent percentage of monthly water diversion demand for the period of non-availability, July 1 to October 31.

4.1.2 "Depletion by Diversion" Determination The attached table titled, "D-1030 Reservation Evaluation" (see Appendix 2), provides a tabular summary of recorded Russian River mainstem water rights applications in Sonoma County. The table also summarizes the results of the Division's past depletion studies noted above, which cover the period 1949 through 1982. For the period 1949 through 1982, the summarized "water demand" results are based on a calculated methodology described in a report entitled "Report on the Russian River in Sonoma County" (File: 050.10). For the period 1983 through 1996, the summarized "water demand" results are based on the above described methodology; (i.e., maximum monthly water demand is based on specified annual demand averaged over the season of diversion).

Based on Division staffs' periodically conducted depletion studies, as summarized in Appendix 2, 7,491.51 af of D-1030's Sonoma County's reservation of 10,000 af has been depleted by existing permitted and licensed applications, leaving 2,508.49 af available for appropriation - a quantity sufficient to cover the total chargeable pending demand of 1,713 af during the chargeable period of July 1 to October 31.

Table 2 provides a summary of pending applications for the Russian River mainstem in Sonoma County.

TABLE 2
Summary of Pending Applications
Russian River Mainstem - Sonoma County

APPLICATION NUMBER	FILE DATE	APPLICANT	DIRECT DIVERSION (CFS)	STORAGE DEMAND (AF)	USE	SEASON	PROTESTED	PROTEST TYPE
A-292462	04/11/89	RUSSELL	0.22	28.0	I, F, R, D, F	3/15-4/30 (D/D)	NO	
A-29737	05/02/90	WINDSOR WATER DISTRICT	11.1	0	M	1/1-12/31	YES	E, I
A-29901	02/06/91	RUSSIAN RIVER COUNTY WATER DISTRICT	0.66	0	M	1/1-12/31	NO	
A-30199	07/23/93	RIVERVIEW II HOMEOWNERS ASSOCIATION	0.04	0	I	3/1-10/31	NO	
A-30391	08/15/94	SWEETWATER SPRING ROAD MUTUAL WATER COMPANY	0.07	0	I, N, D, S	10/15-4/15	NO	
A-30397	09/07/94	HELMHOLZ	6,000 GPD	0	I	3/15-11/15	NO	
A-30412	11/10/94	FIELD STONE WINERY	0.5	0	I, D, J	1/1-12/31	NO	

NOTE: I=IRRIGATION, N=FROST PROTECTION, L=HEAT CONTROL, F=FIRE PROTECTION, D=DOMESTIC, M=MUNICIPAL, J=INDUSTRIAL, S=STOCKWATERING
PROTEST TYPE: E=ENVIRONMENTAL, I=INJURY TO VESTED RIGHT

APPENDIX 2

D-1030 RESERVATION EVALUATION
EVALUATION TABLE
SONOMA COUNTY

D-1030 RESERVATION EVALUATION

(10,000 ACRE-FEET IN SONOMA COUNTY)

application number	application filing date	permit number	license number	license issue date	maximum direct diversion (cfs)	direct diversion season	source name	water demand July 1 - October 31 (af) (SEE NOTE)	cumulative total water demand July 1 - October 31 (af)	percent of D-1030 10,000 acre-foot reservation
A002928	07/14/22	001230	000407	12/02/25	0.06	5/15 - 10/15	RUSSIAN RIVER			
A003633	09/08/23	001729	000704	04/18/28	0.69	5/1 - 9/10	RUSSIAN RIVER			
A007006	07/14/31	003789	009393	05/26/70	0.11	1/1 - 12/31	RUSSIAN RIVER			
A008974	05/17/37	004964	002952	03/27/48	0.5	5/1 - 11/1	RUSSIAN RIVER			
A010795	04/07/44	006264	003697	04/06/53	1	5/1 - 10/31	RUSSIAN RIVER			
A010976	02/08/45	006379	003208	06/26/51	0.15	6/1 - 7/31	RUSSIAN RIVER			
A011846	04/28/47	006957	003411	03/09/52	0.35	5/1 - 10/30	RUSSIAN RIVER			
A012452	03/29/48	007380	003647	10/31/52	0.2	6/1 - 9/31	RUSSIAN RIVER			
A013062	04/29/49	007869	007235	03/30/65	1.1	5/1 - 10/1	RUSSIAN RIVER UNDERFLOW	pre-1949 use	0.00	0.00%
A013076	05/09/49	008189	003885	02/11/54	0.27	5/1 - 10/31	RUSSIAN RIVER	pre-1949 use	0.00	0.00%
A013097	05/17/49	007787	004257	03/21/56	0.0015	5/1 - 9/15	RUSSIAN RIVER UNDERFLOW	pre-1949 use	0.00	0.00%
A013098	05/17/49	007791	004070	03/25/55	0.37	5/1 - 11/1	RUSSIAN RIVER UNDERFLOW	pre-1949 use	0.00	0.00%
A013105	05/19/49	007804	003869	01/26/54	0.06	6/15 - 8/15	RUSSIAN RIVER	pre-1949 use	0.00	0.00%
A013126B	06/01/49	007788	004107B	09/22/83	0.37	5/1 - 9/15	RUSSIAN RIVER UNDERFLOW	51.00	51.00	0.51%
A013126A	06/01/49	007788	004107A	09/22/83	0.88	5/1 - 9/15	RUSSIAN RIVER UNDERFLOW	51.00	102.00	1.02%
A013135	06/06/49	007841	006124	12/27/60	0.31	5/1 - 9/1	RUSSIAN RIVER	pre-1949 use	102.00	1.02%
A013151	06/13/49	007839	003735	05/20/53	0.32	5/1 - 9/15	RUSSIAN RIVER	pre-1949 use	102.00	1.02%
A013182A	06/29/49	007859	004453A	06/15/73	0.085	4/15 - 11/1	RUSSIAN RIVER	pre-1949 use	102.00	1.02%
A013182B	06/29/49	007859	004453B	06/15/73	0.195	4/15 - 11/1	RUSSIAN RIVER	46.33	148.33	1.48%
A013217	07/08/49	007847			3	1/1 - 12/31	RUSSIAN RIVER UNDERFLOW	513.87	662.20	6.62%
A013261	07/26/49	007842	006125	12/27/60	0.12	5/1 - 12/1	RUSSIAN RIVER UNDERFLOW	pre-1949 use	662.20	6.62%
A013267	07/28/49	007862	003956	06/10/54	0.43	5/1 - 11/1	RUSSIAN RIVER UNDERFLOW	pre-1949 use	662.20	6.62%
A013268	07/28/49	007834	004867	12/11/57	0.18	5/1 - 11/1	RUSSIAN RIVER UNDERFLOW	16.93	679.13	6.79%
A013277 +	08/04/49	007793	005821	10/22/59	0.59	4/15 - 10/15	RUSSIAN RIVER UNDERFLOW	23.85	702.98	7.03%
A013281A +	08/08/49	007875	004450A	06/14/73	1.133	5/15 - 10/15	RUSSIAN RIVER	235.54	938.52	9.39%
A013281B	08/08/49	007875	004450B	06/14/73	0.067	5/15 - 10/15	RUSSIAN RIVER	13.92	952.44	9.52%
A013289	08/09/49	007866	005377	10/22/58	0.19	4/1 - 9/1	RUSSIAN RIVER UNDERFLOW	8.80	961.24	9.61%
A013317	08/29/49	007865	006305	06/05/61	0.24	4/15 - 10/15	RUSSIAN RIVER	49.90	1011.14	10.11%
A013331	09/06/49	007904	003795	08/17/53	0.95	5/1 - 11/1	RUSSIAN RIVER	pre-1949 use	1011.14	10.11%
A013359	09/20/49	007892	010505	08/11/75	0.9	4/1 - 9/15	RUSSIAN RIVER	63.36	1074.50	10.75%
A013384 +	10/05/49	008192	005559	03/24/59	0.88	5/1 - 10/31	RUSSIAN RIVER	209.09	1283.59	12.84%
A013391	10/07/49	007898	005055	03/31/58	0.26	5/1 - 9/1	RUSSIAN RIVER	pre-1949 use	1283.59	12.84%
A013393	10/11/49	008297	004730	10/10/57	0.37	5/1 - 9/1	RUSSIAN RIVER	pre-1949 use	1283.59	12.84%
A013406	10/20/49	007928	004393	07/03/56	0.1	4/1 - 11/15	RUSSIAN RIVER	23.76	1307.35	13.07%
A013453	11/09/49	008026	006095	08/26/60	0.18	5/1 - 12/1	RUSSIAN RIVER	42.77	1350.12	13.50%
A013468	11/17/49	007933	007050	11/05/64	0.12	4/1 - 12/31	RUSSIAN RIVER	pre-1949 use	1350.12	13.50%
A013474	11/21/49	008059	007511	11/04/65	0.45	4/1 - 12/1	RUSSIAN RIVER UNDERFLOW	109.59	1459.71	14.60%
A013579	02/14/50	008122	007051	11/05/64	0.17	4/1 - 12/1	RUSSIAN RIVER	43.12	1502.83	15.03%

application number	application filing date	permit number	license number	license issue date	maximum direct diversion (cfs)	direct diversion season	source name	water demand July 1 - October 31 (af) (SEE NOTE)	cumulative total water demand July 1 - October 31 (af)	percent of D-1030 10,000 acre-feet reservation
A013684	04/11/50	008175	004729	10/10/57	0.32	5/1 - 12/1	RUSSIAN RIVER	76.03	1578.86	15.79%
A013729	05/10/50	008186	004930	12/31/57	0.3	5/15 - 11/1	RUSSIAN RIVER UNDERFLOW	pre-1949 use	1578.86	15.79%
A013758	05/23/50	008308	004457	12/26/56	0.125	5/1 - 11/1	RUSSIAN RIVER	pre-1949 use	1578.86	15.79%
A013789	06/14/50	008335	004514	01/07/57	0.12	5/1 - 11/1	RUSSIAN RIVER UNDERFLOW	21.42	1600.28	16.00%
A013811 +	06/22/50	008345	004157	12/30/55	0.325	4/1 - 10/1	RUSSIAN RIVER UNDERFLOW	7.40	1607.68	16.08%
A013810	06/22/50	008344	006530	04/16/62	0.031	1/1 - 12/31	RUSSIAN RIVER UNDERFLOW	pre-1949 use	1607.68	16.08%
A013831	07/05/50	008348	003857	12/17/53	0.11	4/1 - 11/1	RUSSIAN RIVER UNDERFLOW	pre-1949 use	1607.68	16.08%
A013832	07/05/50	008352	004458	12/26/57	0.066	5/1 - 11/1	RUSSIAN RIVER UNDERFLOW	pre-1949 use	1607.68	16.08%
A013862	07/25/50	008366	004158	12/30/55	0.12	4/1 - 11/1	RUSSIAN RIVER UNDERFLOW	pre-1949 use	1607.68	16.08%
A013863	07/25/50	008367	004159	12/30/55	0.23	4/15 - 10/15	RUSSIAN RIVER UNDERFLOW	pre-1949 use	1607.68	16.08%
A013864	07/25/50	008368	004806	10/24/57	0.0038	1/1 - 12/31	RUSSIAN RIVER UNDERFLOW	pre-1949 use	1607.68	16.08%
A013874	07/31/50	008370	005285	07/15/58	0.71	4/15 - 10/15	RUSSIAN RIVER	0.92	1608.60	16.09%
A013932 +	09/05/50	008380	005902	12/07/59	0.18	4/1 - 11/1	RUSSIAN RIVER UNDERFLOW	124.23	1732.83	17.33%
A013933	09/05/50	008399	004739	10/11/57	1	4/1 - 11/1	RUSSIAN RIVER UNDERFLOW	16.84	1749.67	17.50%
A013945	09/11/50	008382	004980	03/21/58	0.34	7/1 - 11/1	RUSSIAN RIVER UNDERFLOW	pre-1949 use	1749.67	17.50%
A013984	10/09/50	008579	004153	12/30/55	0.35	5/15 - 11/15	RUSSIAN RIVER UNDERFLOW	pre-1949 use	1749.67	17.50%
A013985	10/09/50	008580	004154	12/30/55	0.22	5/15 - 11/15	RUSSIAN RIVER UNDERFLOW	pre-1949 use	1749.67	17.50%
A013987	10/09/50	008409	004489	01/07/57	0.035	4/1 - 12/1	RUSSIAN RIVER UNDERFLOW	52.27	1801.94	18.02%
A013989 +	10/09/50	008395	004748	10/11/57	0.08	4/1 - 11/1	RUSSIAN RIVER UNDERFLOW	pre-1949 use	1801.94	18.02%
A014030	11/03/50	008415	009491	10/26/70	0.32	7/1 - 9/30	RUSSIAN RIVER	15.30	1817.24	18.17%
A014033	11/08/50	008568	005805	10/22/59	0.96	4/15 - 10/15	RUSSIAN RIVER UNDERFLOW	19.50	1836.74	18.37%
A014034	11/13/50	008421	004538	02/11/57	0.18	5/1 - 11/1	RUSSIAN RIVER UNDERFLOW	109.27	1946.01	19.46%
A014044A	11/13/50		004482A		0.17	4/1 - 11/1	RUSSIAN RIVER UNDERFLOW	pre-1949 use	1946.01	19.46%
A014044B	11/13/50	008636	005767	07/30/59	0.028	1/1 - 12/31	RUSSIAN RIVER UNDERFLOW	3.41	1949.42	19.49%
A014045	11/13/50	008553	004733	10/10/57	0.17	4/1 - 11/1	RUSSIAN RIVER UNDERFLOW	14.99	1964.41	19.64%
A014047 +	11/14/50	008554	005174	06/09/58	0.17	4/1 - 11/1	RUSSIAN RIVER UNDERFLOW	pre-1949 use	1964.41	19.64%
A014048	11/14/50	008555	004483	12/18/56	0.36	4/1 - 12/1	RUSSIAN RIVER UNDERFLOW	pre-1949 use	1973.21	19.73%
A014049 +	11/14/50	008556	005625	04/09/59	0.1	5/1 - 10/31	RUSSIAN RIVER UNDERFLOW	8.80	1973.21	19.73%
A014050	11/14/50	008557	004843	11/01/57	0.27	4/1 - 12/1	RUSSIAN RIVER UNDERFLOW	pre-1949 use	1973.21	19.73%
A014051	11/14/50	8558	5724		0.33	5/1-10/15	RUSSIAN RIVER UNDERFLOW	pre-1949 use	1973.21	19.73%
A014061	11/20/50	008590	007546	03/09/66	0.68	4/1 - 12/1	RUSSIAN RIVER UNDERFLOW	46.64	2019.85	20.20%
A014065 +	02/02/51	008559	005108	05/12/58	0.49	4/1 - 11/1	RUSSIAN RIVER UNDERFLOW	9.88	2029.73	20.30%
A014144 +	02/26/51	008561	004516	01/09/57	0.39	4/1 - 11/1	RUSSIAN RIVER	45.85	2075.58	20.76%
A014172	03/05/51	008748	004216	03/21/56	0.1	6/1 - 11/1	RUSSIAN RIVER	23.76	2099.34	20.99%
A014178	03/21/51	008733	010595	03/02/76	0.51	4/1 - 9/1	RUSSIAN RIVER UNDERFLOW	pre-1949 use	2099.34	20.99%
A014215 +	03/26/51	008642	004518	01/09/57	0.5	4/1 - 11/1	RUSSIAN RIVER UNDERFLOW	24.28	2123.62	21.24%
A014245 +	04/11/51	008644	004520	01/09/57	0.14	5/1 - 12/1	RUSSIAN RIVER UNDERFLOW	12.24	2135.86	21.36%
A014246 +	04/11/51	008645	005047	03/31/58	0.09	4/1 - 11/1	RUSSIAN RIVER UNDERFLOW	5.10	2140.96	21.41%
A014333 +	06/05/51	008909	006096	08/26/60	2.15	4/1 - 12/31	RUSSIAN RIVER	97.42	2238.38	22.38%
A014339 +	06/07/51	008753	005054	04/01/58	0.9	4/1 - 11/1	RUSSIAN RIVER	20.40	2258.78	22.59%

application number	application filing date	permit number	license number	license issue date	maximum direct diversion (cfs)	direct diversion season	source name	water demand July 1 - October 31 (af) (SEE NOTE)	cumulative total water demand July 1 - October 31 (af)	percent of D-1030 10,000 acre-feet reservation
A014393 +	07/16/51	008754	005613	04/09/59	0.45	5/15 - 11/1	RUSSIAN RIVER UNDERFLOW	24.40	2283.18	22.83%
A014459	08/31/51	008912	006733	05/28/63	0.5	4/1 - 12/1	RUSSIAN RIVER	pre-1949 use	2283.18	22.83%
A014467	09/06/51	008901	006779	06/06/63	0.01	1/1 - 12/31	RUSSIAN RIVER UNDERFLOW	2.45	2285.63	22.85%
A014492	09/19/51	008877	004769	10/24/57	0.17	4/1 - 11/1	RUSSIAN RIVER	pre-1949 use	2285.63	22.85%
A014604	12/17/51	008950	005455	02/02/59	0.07	5/1 - 10/1	RUSSIAN RIVER	pre-1949 use	2285.63	22.85%
A014720	03/20/52	009066	005297	07/15/58	0.26	5/15 - 11/1	RUSSIAN RIVER UNDERFLOW	pre-1949 use	2285.63	22.85%
A014747	04/14/52	009067	004838	11/01/57	1.75	5/1 - 11/1	RUSSIAN RIVER	123.20	2408.83	24.09%
A014750	04/15/52	009068	004992	03/24/58	0.09	4/1 - 11/1	RUSSIAN RIVER	11.83	2420.66	24.21%
A014762	04/18/52	009063	006886	06/11/63	0.9	4/15 - 10/31	RUSSIAN RIVER	pre-1949 use	2420.66	24.21%
A014777	04/25/52	009075	004833	10/24/57	0.69	6/1 - 9/1	RUSSIAN RIVER	43.86	2464.52	24.65%
A014826	05/27/52	009231	004801	10/24/57	0.15	5/15 - 10/1	RUSSIAN RIVER	non-consumptive	2464.52	24.65%
A014855 +	06/12/52	009101	006937	07/18/63	0.7	4/1 - 12/1	RUSSIAN RIVER UNDERFLOW	15.30	2479.82	24.80%
A014856	06/12/52	009102	005272	07/15/58	0.04	5/1 - 11/1	RUSSIAN RIVER UNDERFLOW	pre-1949 use	2479.82	24.80%
A014875	06/25/52	009126	011994	04/30/86	3	4/1 - 9/15	RUSSIAN RIVER UNDERFLOW	pre-1949 use	2479.82	24.80%
A014880	06/26/52	009249	004389	05/21/56	2	1/1 - 12/31	RUSSIAN RIVER UNDERFLOW	487.08	2966.90	29.67%
A014925	07/24/52	009248	009538	01/14/71	0.68	5/1 - 11/1	RUSSIAN RIVER	66.00	3032.90	30.33%
A014942 +	07/30/52	009175	005352	08/20/58	0.15	4/1 - 11/1	RUSSIAN RIVER UNDERFLOW	2.04	3034.94	30.35%
A015233	03/12/53	009536	007203	03/10/65	0.47	4/1 - 12/1	RUSSIAN RIVER	pre-1949 use	3034.94	30.35%
A015277	04/06/53	009519	004974	03/07/58	0.15	4/15 - 11/15	RUSSIAN RIVER UNDERFLOW	pre-1949 use	3034.94	30.35%
A015370	06/05/53	009629	006172	02/15/61	0.52	4/1 - 12/1	RUSSIAN RIVER UNDERFLOW	pre-1949 use	3034.94	30.35%
A015397	07/01/53	009637	005187	06/09/58	0.1	6/1 - 10/1	RUSSIAN RIVER UNDERFLOW	pre-1949 use	3034.94	30.35%
A015399	07/06/53	009630	005162	06/09/58*	0.1	5/1 - 11/1	RUSSIAN RIVER UNDERFLOW	pre-1949 use	3034.94	30.35%
A015664A +	12/29/53	009758	008397A	09/12/89	0.093	4/1 - 10/15	RUSSIAN RIVER	17.42	3052.36	30.52%
A015664C +	12/29/53	009758	008397B	09/12/89	0.072	4/1 - 10/15	RUSSIAN RIVER	17.42	3069.78	30.70%
A015726 +	02/16/54	009957	005552	03/24/59	0.42	4/1 - 10/15	RUSSIAN RIVER	17.42	3087.20	30.87%
A015727	02/16/54	010141	005931	01/08/60	0.2	5/1 - 11/1	RUSSIAN RIVER UNDERFLOW	43.86	3131.06	31.31%
A015728	02/16/54	009958	006828	06/07/63	0.15	1/1 - 12/31	RUSSIAN RIVER UNDERFLOW	83.21	3214.27	32.14%
A015729	02/16/54	009959	005448	02/02/59	0.22	4/1 - 12/1	RUSSIAN RIVER UNDERFLOW	pre-1949 use	3214.27	32.14%
A015736	02/18/54	012949			20	5/1 - 11/15	RUSSIAN RIVER UNDERFLOW	52.27	3266.54	32.67%
A015737	02/18/54	012950			60	1/1 - 12/31	RUSSIAN RIVER	SCWA	3266.54	32.67%
A015779	03/17/54	012951	007615	03/09/66	0	4/1 - 9/30	RUSSIAN RIVER	SCWA	3266.54	32.67%
A015984	08/06/54	009995	005798	10/22/59	0.01	5/15 - 9/15 *	RUSSIAN RIVER	SCWA	3266.54	32.67%
A016141	11/17/54	010123	005029	03/31/58	0.06	1/1 - 12/31	RUSSIAN RIVER UNDERFLOW	0.96	3267.50	32.68%
A016319	04/19/55	010182	006414	12/28/61	0.4	1/1 - 12/31	RUSSIAN RIVER UNDERFLOW	5.91	3273.41	32.73%
A016321	04/20/55	010185	005868	11/17/59	0.66	4/1 - 12/1	RUSSIAN RIVER UNDERFLOW	pre-1949 use	3273.41	32.73%
A016357 +	05/03/55	010313	005823	10/22/59	0.33	5/1 - 10/15	RUSSIAN RIVER UNDERFLOW	pre-1949 use	3273.41	32.73%
A016398	05/27/55	010481	006454	02/03/62	0.16	4/15 - 11/15	RUSSIAN RIVER	25.75	3299.16	32.99%
A016404 +	06/03/55	010457	006525	04/16/62	0.5	4/1 - 11/1	RUSSIAN RIVER	12.56	3311.72	33.12%
A016405	06/03/55	010314	006598	12/06/62	0.4	4/1 - 11/1	RUSSIAN RIVER	24.91	3336.63	33.37%
A016440	06/24/55	010380	009628	03/17/71	0.85	5/1 - 11/1	RUSSIAN RIVER UNDERFLOW	pre-1949 use	3336.63	33.37%

application number	application filing date	permit number	license number	license issue date	maximum direct diversion (cfs)	direct diversion season	source name	water demand July 1 - October 31 (af) (SEE NOTE)	cumulative total water demand July 1 - October 31 (af)	percent of D-1030 10,000 acre-foot reservation
A016457	07/11/55	010421	007067	11/06/64	0.63	4/1 - 12/1	RUSSIAN RIVER UNDERFLOW	pre-1949 use	3336.63	33.37%
A016525	08/15/55	010383	005739	06/30/59	0.06	4/15 - 11/1	RUSSIAN RIVER UNDERFLOW	pre-1949 use	3336.63	33.37%
A016673 +	10/17/55	010450	005803	10/22/59	0.56	4/1 - 11/1	RUSSIAN RIVER	38.91	3375.54	33.76%
A016821	01/06/56	010454	005764	07/29/59	0.1	4/1 - 11/1	RUSSIAN RIVER UNDERFLOW	pre-1949 use	3375.54	33.76%
A017100 +	05/23/56	013589	007956	04/07/67	0.18	5/1 - 10/15	RUSSIAN RIVER	23.46	3399.00	33.99%
A017121	06/08/56	011039			4	1/1 - 12/31	RUSSIAN RIVER UNDERFLOW	974.16	4373.16	43.73%
A017632	05/29/57	013059			1.39	1/1 - 12/31	RUSSIAN RIVER UNDERFLOW	338.52	4711.68	47.12%
A018241	07/30/58	011678	006342	07/06/61	0.12	4/15 - 10/15	RUSSIAN RIVER	24.95	4736.63	47.37%
A018649	04/17/59	014051	008557	04/25/68	2	1/1 - 6/30; 11/1 - 12/3	RUSSIAN RIVER UNDERFLOW	MASONITE	4736.63	47.37%
A019339	04/04/60	013182	009626	03/11/71	0.25	4/1 - 12/1	RUSSIAN RIVER	pre-1949 use	4736.63	47.37%
A020624	02/21/62	013841	009514	12/30/70	0.23	6/1 - 8/31	RUSSIAN RIVER	pre-1949 use	4736.63	47.37%
A021245 +	04/18/63	014738	009568	02/11/71	0.19	4/1 - 10/1	RUSSIAN RIVER UNDERFLOW	26.50	4763.13	47.63%
A021660	02/28/64	014777	009867	03/17/72	0.5	5/1 - 11/30	RUSSIAN RIVER UNDERFLOW	pre-1949 use	4763.13	47.63%
A021756	04/27/64	014750	009385	05/22/70	0.46	1/1 - 12/31	RUSSIAN RIVER UNDERFLOW	pre-1949 use	4763.13	47.63%
A022348	12/10/65	015192	010527	08/19/75	0.18	4/1 - 11/30	RUSSIAN RIVER	pre-1949 use	4763.13	47.63%
A022490	06/09/66	015297	012863	04/21/92	0.02	11/1 - 6/30	RUSSIAN RIVER UNDERFLOW	pre-1949 use	4763.13	47.63%
A023212A	01/21/69	015995A			0.625	4/1 - 6/30	RUSSIAN RIVER UNDERFLOW	pre-1949 use	4763.13	47.63%
A023212B	01/21/69	015995B			0.625	4/1 - 6/30	RUSSIAN RIVER UNDERFLOW	pre-1949 use	4763.13	47.63%
A023639	11/02/70	017059	011614	08/03/84	0.451	3/15 - 5/30	RUSSIAN RIVER UNDERFLOW	pre-1949 use	4763.13	47.63%
A023655	12/14/70	016871			0.5	2/15 - 5/15	RUSSIAN RIVER UNDERFLOW	pre-1949 use	4763.13	47.63%
A024051	04/24/72	017426	012373	02/28/89	0.33	4/1 - 10/31	RUSSIAN RIVER	70.40	4833.53	48.34%
A024266A	12/21/72	017055A	012794	06/26/91	0.075	7/1 - 8/31	RUSSIAN RIVER UNDERFLOW	pre-1949 use	4833.53	48.34%
A024266B	12/21/72	017055B			2.4	3/15 - 5/31	RUSSIAN RIVER UNDERFLOW	pre-1949 use	4833.53	48.34%
A024268A +	12/22/72	017139A	012639	05/17/90	0.86	5/15 - 9/15	RUSSIAN RIVER UNDERFLOW	4.40	4837.93	48.38%
A024268B +	12/22/72	017139B	012640	05/17/90	17.64	1/1 - 5/31; 9/15 - 11/1	RUSSIAN RIVER UNDERFLOW	4.40	4842.33	48.42%
A024269A	12/22/72	017202A	012957	05/06/93	0.44	6/1 - 8/31	RUSSIAN RIVER UNDERFLOW	pre-1949 use	4842.33	48.42%
A024269B	12/22/72	017202B			11.3	3/15 - 5/31	RUSSIAN RIVER UNDERFLOW	pre-1949 use	4842.33	48.42%
A024270A +	12/22/72	017140A	012641	05/17/90	1.22	6/1 - 9/15	RUSSIAN RIVER UNDERFLOW	11.00	4853.33	48.53%
A024270B +	12/22/72	017140B			32	3/1 - 5/31	RUSSIAN RIVER UNDERFLOW	11.00	4864.33	48.64%
A024310A	02/28/73	018315A			5.7	5/15 - 7/15	RUSSIAN RIVER	pre-1949 use	4864.33	48.64%
A024310B	02/28/73	018315B			5	3/15 - 5/15	RUSSIAN RIVER	pre-1949 use	4864.33	48.64%
A024311A	02/08/73	018316A			8.4	5/15 - 7/15	RUSSIAN RIVER UNDERFLOW	pre-1949 use	4864.33	48.64%
A024311B	02/28/73	018316B			7.4	3/15 - 5/15	RUSSIAN RIVER UNDERFLOW	pre-1949 use	4864.33	48.64%
A024678B	08/26/74	017239B			6.37	1/15 - 6/1; 9/15 - 10/3	RUSSIAN RIVER UNDERFLOW	pre-1949 use	4864.33	48.64%
A024762A +	02/28/75	017141A	012642	05/17/90	0.26	6/1 - 8/31	RUSSIAN RIVER UNDERFLOW	15.90	4880.23	48.80%
A024762B +	02/28/75	017141B	012643	05/17/90	6.36	3/1 - 5/31	RUSSIAN RIVER UNDERFLOW	15.90	4896.13	48.96%
A024791	03/31/75	017250	011706	03/08/85	0.015	6/1 - 8/31	RUSSIAN RIVER UNDERFLOW	pre-1949 use	4896.13	48.96%
A024864A	08/25/75	017149A	012890	04/29/92	0.17	6/1 - 8/15	RUSSIAN RIVER	pre-1949 use	4896.13	48.96%
A024864B	08/25/75	017149B			3	3/15 - 5/15	RUSSIAN RIVER	pre-1949 use	4896.13	48.96%
A024865A01	08/26/75	017180A01			0.0007	1/1 - 12/31	RUSSIAN RIVER UNDERFLOW	pre-1949 use	4896.13	48.96%
A024865B	08/26/75	017180B			2.7	4/1 - 6/30	RUSSIAN RIVER UNDERFLOW	pre-1949 use	4896.13	48.96%

application number	application filing date	permit number	license number	license issue date	maximum direct diversion (cfs)	direct diversion season	source name	water demand July 1 - October 31 (af) (SEE NOTE)	cumulative total water demand July 1 - October 31 (af)	percent of D-1030 10,000 acre-foot reservation
A024865A02	08/26/75	017180A02			1	6/1 - 9/30	RUSSIAN RIVER UNDERFLOW	pre-1949 use	4896.13	48.96%
A024877	09/10/75	017199	011579	07/09/84	0.14	3/15 - 5/31	RUSSIAN RIVER	pre-1949 use	4896.13	48.96%
A024887	09/26/75	017170	011493	04/19/84	0.0028	4/1 - 11/1	RUSSIAN RIVER	0.70	4896.83	48.97%
A024889	09/29/75	016941	011551	06/01/84	0.00077	5/1 - 9/30	RUSSIAN RIVER	pre-1949 use	4896.83	48.97%
A024890	09/29/75	017247			0.432	1/1 - 12/31	RUSSIAN RIVER UNDERFLOW	103.21	5000.04	50.00%
A024891	09/30/75	018378	012041	11/12/86	0.2	4/1 - 12/31	RUSSIAN RIVER UNDERFLOW	pre-1949 use	5000.04	50.00%
A024894 +	09/30/75	017147			0.55	6/1 - 10/31	RUSSIAN RIVER UNDERFLOW	14.08	5014.12	50.14%
A024892A	09/30/75	017686A			12.25	6/1 - 10/31	RUSSIAN RIVER UNDERFLOW	16.50	5030.62	50.31%
A024892B	09/30/75	017688B			12.25	4/1 - 5/31	RUSSIAN RIVER UNDERFLOW	16.50	5047.12	50.47%
A024893A +	09/30/75	017731A	012617	04/23/90	0.41	6/1 - 8/31	RUSSIAN RIVER UNDERFLOW	11.53	5058.65	50.59%
A024893B +	09/30/75	017731B			9.3	4/1 - 5/31	RUSSIAN RIVER UNDERFLOW	11.53	5070.18	50.70%
A024899 +	10/14/75	017168	012715	03/27/91	0.052	6/1 - 10/31	RUSSIAN RIVER UNDERFLOW	8.73	5078.91	50.79%
A024903 +	10/17/75	017162	011543	06/01/84	0.28	4/1 - 9/30	RUSSIAN RIVER UNDERFLOW	5.10	5084.01	50.84%
A024908	10/21/75	016960	011312	02/01/83	0.0011	4/1 - 9/30	RUSSIAN RIVER	pre-1949 use	5084.01	50.84%
A024909	10/21/75	017178	011447	02/27/84	0.0069	1/1 - 12/31	RUSSIAN RIVER UNDERFLOW	1.81	5085.82	50.86%
A024912	10/22/75	017365			0.08	1/1 - 12/31	RUSSIAN RIVER UNDERFLOW	19.48	5105.30	51.05%
A024919	10/27/75	017174	011510	05/14/84	0.0031	1/1 - 12/31	RUSSIAN RIVER UNDERFLOW	pre-1949 use	5105.30	51.05%
A024921	10/29/75	017296	011456	03/09/84	0.002	6/1 - 9/30	RUSSIAN RIVER	pre-1949 use	5105.30	51.05%
A024924B	11/06/75	017210A			1.081	1/1 - 12/31	RUSSIAN RIVER UNDERFLOW	pre-1949 use	5105.30	51.05%
A024929	11/17/75	019515			1.84	2/1 - 6/1	RUSSIAN RIVER UNDERFLOW	730.62	5835.92	58.36%
A024931	11/17/75	017243	011526	05/25/84	0.005	1/1 - 12/31	RUSSIAN RIVER UNDERFLOW	pre-1949 use	5835.92	58.36%
A024932	11/17/75	016959	011356	03/02/83	0.0002	1/1 - 12/31	RUSSIAN RIVER UNDERFLOW	pre-1949 use	5835.92	58.36%
A024935	11/18/75	017158	011399	10/06/83	0.0005	1/1 - 12/31	RUSSIAN RIVER	pre-1949 use	5835.92	58.36%
A024951	12/05/75	017643	011661	01/29/85	0.1	3/1-11/1	RUSSIAN RIVER UNDERFLOW	25.88	5861.80	58.62%
A024958A	12/16/75	017193A			0.17	5/1 - 9/1	RUSSIAN RIVER UNDERFLOW	pre-1949 use	5861.80	58.62%
A024958B	12/16/75	017193B			1.59	3/15 - 5/15	RUSSIAN RIVER UNDERFLOW	pre-1949 use	5861.80	58.62%
A024962	12/29/75	017169	011437	02/24/84	0.008	1/1 - 12/31	RUSSIAN RIVER UNDERFLOW	pre-1949 use	5861.80	58.62%
A024963	12/29/75	017295	011425	02/24/84	0.038	4/1 - 10/31	RUSSIAN RIVER UNDERFLOW	pre-1949 use	5861.80	58.62%
A024967 +	01/06/76	017665	011991	04/30/86	0.378	1/1 - 12/31	RUSSIAN RIVER UNDERFLOW	24.08	5885.88	58.86%
A024968A	01/06/76	017666A	013012	06/25/93	0.37	6/1 - 7/31; 6/1 - 9/15	RUSSIAN RIVER UNDERFLOW	pre-1949 use	5885.88	58.86%
A024968B	01/06/76	017666B			4.9	3/15 - 6/1; 9/15 - 11/1	RUSSIAN RIVER UNDERFLOW	pre-1949 use	5885.88	58.86%
A024972	01/12/76	017160	011780	03/27/85	0.59	6/15 - 8/30	RUSSIAN RIVER UNDERFLOW	pre-1949 use	5885.88	58.86%
A024993	02/09/76	017655	011748	03/18/85	0.933	3/1 - 11/1	RUSSIAN RIVER	pre-1949 use	5885.88	58.86%
A025005	02/25/76	017298	011571	06/20/84	0.003	1/1 - 12/31	RUSSIAN RIVER UNDERFLOW	pre-1949 use	5885.88	58.86%
A025010	02/27/76	016916	011419	02/06/84	0.0013	1/1 - 12/31	RUSSIAN RIVER UNDERFLOW	0.33	5886.21	58.86%
A025012	02/27/76	016909	011344	02/24/83	0.0009	1/1 - 12/31	RUSSIAN RIVER UNDERFLOW	0.31	5886.52	58.87%
A025015	03/02/76	017159	011407	01/25/84	0.002	1/1 - 12/31	RUSSIAN RIVER UNDERFLOW	pre-1949 use	5886.52	58.87%
A025021	03/12/76	017232	011540	05/31/84	0.0003	5/1 - 10/1	RUSSIAN RIVER	pre-1949 use	5886.52	58.87%
A025025	03/22/76	017260	011781	03/27/85	0.225	1/1 - 12/31	RUSSIAN RIVER UNDERFLOW	50.28	5936.80	59.37%
A025028	03/24/76	017299	011564	06/20/84	0.025	5/1 - 10/31	RUSSIAN RIVER	3.75	5940.55	59.41%

application number	application filing date	permit number	license number	license issue date	maximum direct diversion (cfs)	direct diversion season	source name	water demand July 1 - October 31 (af) (SEE NOTE)	cumulative total water demand July 1 - October 31 (af)	percent of D-1030 10,000 acre-foot reservation
A025084	06/14/76	016961	011398	10/06/83	0.0003	1/1 - 12/31	RUSSIAN RIVER	pre-1949 use	5940.55	59.41%
A025110	07/21/76	016912	011342	02/22/83	0.0003	1/1 - 12/31	RUSSIAN RIVER UNDERFLOW	0.08	5940.63	59.41%
A025154 +	09/21/76	017150	011653	01/11/85	1.2	6/1 - 9/1	RUSSIAN RIVER UNDERFLOW	45.59	5986.22	59.86%
A025157	09/21/76	017268	011771	03/25/85	0.004	1/1 - 12/31	RUSSIAN RIVER UNDERFLOW	1.50	5987.72	59.88%
A025207	12/07/76	017466	011492	04/19/84	0.0031	1/1 - 12/31	RUSSIAN RIVER UNDERFLOW	pre-1949 use	5987.72	59.88%
A025344	04/27/77	017441			1.6	3/1 - 10/1	RUSSIAN RIVER UNDERFLOW	132.37	6120.09	61.20%
A025363	05/12/77	017703	011714	03/08/85	0.0007	4/1 - 10/31	RUSSIAN RIVER	pre-1949 use	6120.09	61.20%
A025393A	06/13/77	017336A			0.2	5/1 - 8/30	RUSSIAN RIVER UNDERFLOW	pre-1949 use	6120.09	61.20%
A025393B	06/13/77	017336B			0	11/1 - 7/1 *	RUSSIAN RIVER UNDERFLOW	pre-1949 use	6120.09	61.20%
A025394	06/15/77	018438	012216	10/28/87	2.98	1/1 - 12/31	RUSSIAN RIVER	pre-1949 use	6120.09	61.20%
A025682	02/23/78	018139			0.22	1/1 - 12/31	RUSSIAN RIVER UNDERFLOW	55.58	6175.67	61.76%
A025826B	09/15/78	017833B			2.23	4/1 - 5/31	RUSSIAN RIVER UNDERFLOW	33.70	6209.37	62.09%
A026233	02/26/80	018319			0.333	6/1 - 10/30	RUSSIAN RIVER UNDERFLOW	81.12	6290.49	62.90%
A026298	04/15/80	018538			1.201	1/1 - 12/31	RUSSIAN RIVER UNDERFLOW	292.50	6582.99	65.83%
A027211	02/17/82	018984	012864	04/21/92	0.022	7/1 - 10/31	RUSSIAN RIVER UNDERFLOW	5.36	6588.35	65.88%
A027327	05/05/82	018762	012477	02/13/90	0	11/1 - 4/30 *	RUSSIAN RIVER	0.00	6588.35	65.88%
A027362 +	06/14/82	018725			0.41	4/1 - 10/31	RUSSIAN RIVER UNDERFLOW	33.98	6622.33	66.22%
A027478	08/13/82	019008			3	2/15 - 5/15	RUSSIAN RIVER UNDERFLOW	0.00	6622.33	66.22%
A027479	08/13/82	019009			0.86	5/1 - 11/1	RUSSIAN RIVER UNDERFLOW	209.44	6831.77	68.32%
A027941	01/09/84	019401			3	6/1 - 10/1	RUSSIAN RIVER UNDERFLOW	135.50	6967.27	69.67%
A027955	01/23/84	019285			12.25	3/1 - 5/31	RUSSIAN RIVER UNDERFLOW	0.00	6967.27	69.67%
A029405	01/30/89	020459			0	1/1 - 5/31 *	RUSSIAN RIVER UNDERFLOW	0.00	6967.27	69.67%
A029411	02/14/89	020582			0.009	3/15 - 11/15	RUSSIAN RIVER UNDERFLOW	2.19	6969.46	69.69%
A029412	02/14/89	020583			0.175	3/15 - 11/15	RUSSIAN RIVER UNDERFLOW	10.50	6979.96	69.80%
A029418	02/28/89	020484			1	1/1 - 12/31	RUSSIAN RIVER UNDERFLOW	pre-1949 use	6979.96	69.80%
A029419	02/28/89	020485			2.9	3/1 - 7/31	RUSSIAN RIVER UNDERFLOW	pre-1949 use	6979.96	69.80%
A029437	03/14/89	020486			10	3/1 - 5/31	RUSSIAN RIVER UNDERFLOW	pre-1949 use	6979.96	69.80%
A029462	04/11/89				0.655	1/1 - 12/31	RUSSIAN RIVER	1.33	6981.29	69.81%
A029517	07/06/89	020584			1.59	9/15 - 11/15	RUSSIAN RIVER UNDERFLOW	pre-1949 use	6981.29	69.81%
A029547	08/22/89	020521			0	1/1 - 12/31 *	RUSSIAN RIVER UNDERFLOW	0.00	6981.29	69.81%
A029662	02/20/90	020547			0.131	4/1 - 10/15	RUSSIAN RIVER UNDERFLOW	27.75	7009.04	70.09%
A029737	05/02/90				11.14	1/1 - 12/31	RUSSIAN RIVER UNDERFLOW	1575.00	8584.04	85.84%
A029789	08/03/90	020552			2	7/1 - 10/31	RUSSIAN RIVER UNDERFLOW	483.00	9067.04	90.67%
A029901	02/06/91				0.66	1/1 - 12/31	RUSSIAN RIVER UNDERFLOW	100.66	9167.70	91.68%
A030199	12/10/92				0.04	4/1 - 10/31	RUSSIAN RIVER UNDERFLOW	2.17	9169.87	91.70%
D030211R	01/20/93	000182R		03/25/93	0.0013	1/1 - 12/31	RUSSIAN RIVER UNDERFLOW	0.32	9170.19	91.70%
D030220R	02/04/93	000183R		03/25/93	0.001	1/1 - 12/31	RUSSIAN RIVER UNDERFLOW	0.24	9170.43	91.70%
D030221R	02/04/93	000184R		03/25/93	0.001	1/1 - 12/31	RUSSIAN RIVER UNDERFLOW	0.24	9170.67	91.71%
A030391	08/15/94				0.7	10/15 - 4/15	RUSSIAN RIVER UNDERFLOW	25.25	9195.92	91.96%
A030397	09/07/94				0.009	3/15 - 11/15	RUSSIAN RIVER UNDERFLOW	2.28	9198.20	91.98%
A030412	11/10/94				0.5	1/1 - 12/31	RUSSIAN RIVER UNDERFLOW	6.66	9204.86	92.05%

NOTE: 1949 THROUGH 1982 DEMAND BASED ON DIVISION TABULATION THROUGH 1982 AS SUMMARIZED BY MEMO DATED OCTOBER 7, 1982 (FILE: 050.10)

1983 THROUGH 1996 DEMAND BASED ON MAXIMUM ANNUAL USE FIGURE SPECIFIED IN SUBMITTED APPLICATIONS

NOTE: + SIGN AFTER APPLICATION NUMBER INDICATES THAT THE PROJECT'S WATER DEMAND DURING THE PERIOD 7/1 TO 10/31 WAS PRO-RATED BASED ON PERCENTAGE OF APPLICATION PLACE OF USED IDENTIFIED AS BEING WITHIN PRE-1914 USE AREA.

TOTAL POST 1949 APPLICATIONS = 243

TOTAL PROJECTS UNDER PERMIT = 54

TOTAL PROJECTS UNDER LICENSE = 182

TOTAL UNPERMITTED PROJECTS = 7

ATTACHMENT D
RUSSIAN RIVER MAILING LIST

RUSSIAN RIVER MAILING LIST
PENDING APPLICATIONS

#A027177
UNION OIL COMPANY OF CALIFORNIA
LAND DEPARTMENT
1300 N DUTTON AVE.
SANTA ROSA, CA 95401

#A029201
NORTHERN CALIFORNIA POWER AGENCY
C/O STEVE ENEDY
P.O. BOX 663
MIDDLETOWN, CA 95461

#A029202, #A029203
TRIONE, TRUSTEES
C/O VIMARK, INC.
P.O. BOX NN
SANTA ROSA, CA 95402

#A029381, #A030412
C/O MURRAY, BURNS & KIENLEN
1616 29TH ST., STE 300
SACRAMENTO, CA 95816

#A029444, #A030044
CAMP MEEKER RECREATION & PARKS
C/O HAL WOOD
P.O. BOX 730
FORESTVILLE, CA 95436

#A029462
THE RUSSELL FAMILY TRUST
1728 GRANT STREET
BIRMINGHAM, MI 48009-2036

#A029479
RONALD RUCKER
2500 TINDALL RANCH ROAD
UKIAH, CA 95482

#A029511, #A029512
HILLBRETH FARMS
C/O MIKE HILBRETH
1520 RUDDICK CUNNINGHAM ROAD
UKIAH, CA 95422

#A029525, #A029526
JIM NELSON
7299 SOUTH HIGHWAY 101
UKIAH, CA 95482

#A029591, #A029592
JOHNSON ORCHARDS
C/O FRANCIS JOHNSON
801 BABCOCK LN.
UKIAH, CA 95482

#A029663
PRUETT, TRUSTEES
C/O ANITA PRUETT
4100 WALLACE CREEK ROAD
HEALDSBURG, CA 95448

#A029703, #A029704, #A029705
#A029706, #A029707, #A029708
#A029811
KENDALL-JACKSON WINERY LTD.
421 AVIATION BLVD
SANTA ROSA, CA 95403

#A029715, #A029783, #A029983
#A030015, #A030282, #A030534
C/O JAMES C HANSON ENGINEERING
444 N THIRD ST., STE. 400
SACRAMENTO, CA 95814

#A029737
WINDSOR WATER DISTRICT
P.O. BOX 100
WINDSOR, CA 95492

#A029754
FOOTHILLS PROPERTY OWNERS ASSOC.
C/O LESLIE WILCOX
P.O. BOX 497
FULTON, CA 95439

#A029760
BRUTOCAL VINEYARDS
C/O TONY STEPHEN
P.O. BOX 780
HOPLAND, CA 95449

#A029763, #A029764, #A029765
C/O SCHERF & RAU, INC.
100 NORTH PINE STREET
UKIAH, CA 95482

#A029772
MICHAEL SAAS
8215 STARR ROAD
WINDSOR, CA 95492

#A029784
DAVID BURTON
6 SILVER LACE COURT
SAN RAFAEL, CA 94903

#A029802, #A030051, #A030259
#A030336
C/O LEE ERICKSON
P.O. BOX 446
VALLEY FORD, CA 94972-0446

#A029848, #A029849, #A029850
C/O MARK LINGENFELDER
10300 CHALK HILL ROAD
HEALDSBURG, CA 95448

#A029858, #A029998, #A030540
#A030583
C/O NAPA VALLEY VINEYARD ENGR.
176 MAIN ST., STE. B
ST HELENA, CA 94574

#A029901
C/O JAMES DAUGHERTY
P.O. BOX 1895
SANTA ROSA, CA 95402

#A029908
C/O ANDY BORDESSA & ASSOC.
P.O. BOX M
UKIAH, CA 95482

#A029962
C/O MILTON HUDIS
2360 PROFESSIONAL DRIVE
SANTA ROSA, CA 95403

#A030036
JOHNSON ORCHARDS
C/O THOMAS JOHNSON
525 S MAIN STREET
UKIAH, CA 95482

#A030077
CAZADERO WATER COMPANY
C/O JIM BERRY
P.O. BOX 423
CAZADERO, CA 95421

#A030126
FIORE MARCHESCHI
1118 SAN ANTONIO AVE.
ALAMEDA, CA 94510

#A030161, #A030162, #A030163
#A030170
C/O ALEXANDER THOMAS
P.O. BOX 748
UKIAH, CA 95482

#A030179
C/O JACK LOCEY
BRELJE & RACE
P.O. BOX 1895
SANTA ROSA, CA 95402

#A030181
KEN RITCHIE
P.O. BOX 978
FORESTVILLE, CA 95436

#A030182
C/O ANDY ANDERSEN
P.O. BOX 1130
MODESTO, CA 95353

#A030223
LEONARD MARR
7809 LYNCH RD.
SEBASTOPOL, CA 95472

#A030290
BRIAN WHITE
313 HENRY STATION ROAD
UKIAH, CA 95482

#A030349
RUDOLPH LIGHT
101 W CHURCH ST.
UKIAH, CA 95482

#A030363
SHAWNA TODD
P.O. BOX 779
REDWOOD VALLEY, CA 95470

#A030364, #A030365
C/O TOM ATTERBURY
16109 HEALDSBURG AVE., STE D
HEALDSBURG, CA 95448

#A029333
J KEEFER
3933 GREEN VALLEY SCHOOL ROAD
SEBASTOPOL, CA 95472

#A030036
THOMAS JOHNSON
525 S MAIN ST.
UKIAH, CA 95482

#A030199
C/O CARL ELZE
1145 ORCHARD ST.
HEALDSBURG, CA 95448

#A030391
C/O LEO BECNEL
911 MEDICAL CENTER PLZ, #11
WINDSOR, CA 95492

#A030186
AUSTIN ACRES MUTUAL WATER
COMPANY
1010 AUSTIN CREEK ROAD
CAZADERO, CA 95421

#A030397
AUGUST HELMHOLZ
28 CREST ROAD
LAFAYETTE, CA 94549

#A030429
C/O WILLIAM MACIVER
6097 BENNETT VALLEY ROAD
SANTA ROSA, CA 95404

#A030518
C/O DANIEL GALLERY, ESQ.
926 J STREET, SUITE 505
SACRAMENTO, CA 95814

#A030553, #A030544
MILOVINA BROTHERS
P.O. BOX 302
HOPLAND, CA 95449

#A030560, #A030564
MOERMAN
11500 BURRIS LANE
POTTER VALLEY, CA 95469

#A030615
RAY BARTOLOMEI
1075 KNOB HILL RD.
UKIAH, CA 95482

RUSSIAN RIVER MAILING LIST
UNACCEPTED APPLICATIONS

#X000114
BRUTOCAL VINEYARDS
P.O. BOX 740
HOPLAND, CA 95449

#X000127
THOMAS F JOHNSON, ESQ
JOHNSON AND DEMARCHI, INC.
525 SOUTH MAIN STREET, STE B
UKIAH, CA 95482

#X000128-000134
KOHN PROPERTIES
C/O THOMAS F JOHNSON, ESQ
JOHNSON AND DEMARCHI, INC.
525 SOUTH MAIN STREET, STE B
UKIAH, CA 95482

#X000313
MENDOCINO CO RUSSIAN RIVER FLOOD
CONTROL
WATER CONSRVATION IMPROVMENT
DISTRICT
C/O GARY AKERSTROM
425 TALMAGE ROAD
UKAIH, CA 95482

#X000448
CITY OF CLOVERDALE
C/O SCOTT REYNOLDS
P O BOX 217
CLOVERDALE, CA 95425

**RUSSIAN RIVER MAILING LIST
FEDERAL AGENCIES**

U.S. Army Corp of Engineers
211 Main Street, SPNPE-R
San Francisco, CA 94105

U.S. Army Corp of Engineers
c/o Mark Bartholomew
333 Market Street
San Francisco, CA 94105

U.S. Army Corp of Engineers
c/o Christopher Eng
Environmental Manager
333 Market Street
San Francisco, CA 94105

U.S. Army Corp of Engineers
c/o Jim Mullens, Hydrologist
Environmental Manager
333 Market Street
San Francisco, CA 94105

U.S. Army Corp of Engineers
c/o Kenneth Watts, Economist
333 Market Street
San Francisco, CA 94105

National Marine Fisheries
Service
c/o Jim Bybee, Environmental
Coordinator
777 Sonoma Avenue
Santa Rosa, CA 95403

National Marine Fisheries
Service
c/o Chris Mobley, Fishery
Biologist
777 Sonoma Avenue, Room 325
Santa Rosa, CA 95403

Natural Resources Conservation
Service
c/o John Lowrie
2121-C Second Street, Suite 102
Davis, CA 95616

U.S. Environmental Protection
Agency
c/o Janet Hashimoto, Chief
75 Hawthorne Street (W-2)
San Francisco, CA 94105

U.S. Environmental Protection
Agency
c/o Maria Rea, Chief
75 Hawthorne Street (W-3-2)
San Francisco, CA 94105

U.S. Environmental Protection
Agency
c/o David Smith
TMDL Coordinator
75 Hawthorne Street (W-3-1)
San Francisco, CA 94105

U.S. Environmental Protection
Agency
c/o Alexis Strauss
Water Management Division
75 Hawthorne Street (W-3-1)
San Francisco, CA 94105

U.S Geological Survey
c/o Rick Iwatsubo
2800 Cottage Way, Room W-2233
Sacramento, CA 95825

U.S Geological Survey
c/o Barry Kerr
2800 Cottage Way, Room W-2233
Sacramento, CA 95825

U.S Geological Survey
c/o Marc Sylvester
Assistant regional Hydrologist
245 Middlefield Road, Mail stop
#470
Menlo Park, CA 94025

U.S Geological Survey
c/o Ken Markham
2800 Cottage Way, Room W-2233
Sacramento, CA 95825

U.S Geological Survey
c/o Rich Hunrichs
2800 Cottage Way, Room W-2538
Sacramento, CA 95825

U.S. Fish and Wildlife Service
c/o Tom Kisanuki
1125 16th Street, Room 209
Arcata, CA 95521

U.S. Fish and Wildlife Service
c/o Steve Schwarzbach
2800 Cottage Way, Room E-1803
Sacramento, CA 95825

Federal Energy Regulatory
Commission
c/o Tim Welch
888 First Street, NE, Room 51-27
Washington, DC 20426

U.S. Soil Conservation Service
c/o Richard King
District Conservationist
777 Sonoma, Room 212
Santa Rosa, CA 95404

U.S. Soil Conservation Service
c/o Tom Schott
District Conservationist
405 Orchard Ave.
Ukiah, CA 95482

National Parks Service
c/o Linda Stonier
2107 Prince Street
Berkeley, CA 94705

**RUSSIAN RIVER MAILING LIST
STATE AGENCIES**

California Resources Agency
c/o Secretary
1416 Ninth Street, Room 1311
Sacramento, CA 95814

California Resources Agency
c/o John Amidio, Assistant
Secretary
1416 Ninth Street
Sacramento, CA 95814

California Department of Justice
c/o Ken Williams
Deputy Attorney General
1300 I Street, Suite 125
Sacramento, CA 95814

California Department of Fish
and Game
c/o Chief
Environmental Services
1416 Ninth Street
Sacramento, CA 95814

California Department of Fish
and Game
c/o Allen Buckmann
1420 Tubbs Lane
Calistoga, CA 94515

California Department of Fish
and Game
c/o Bill Cox, Fisheries
Biologist
8699 Mill Station Road
Sebastopol, CA 95472

California Department of Fish
and Game
Central Coast, Region 3
c/o Brian Hunter, Regional
Manager
P.O. Box 47
Yountville, CA 94599

California Department of Fish
and Game
Central Coast, Region 3
c/o Weldon Jones
540 Zinfandel
Ukiah, CA 95482

California Department of Fish
and Game
Central Coast, Region 3
c/o Rick Machado
P.O. Box 1338
Cobb, CA 95426

California Department of Fish
and Game
Central Coast, Region 3
c/o Mike Rugg
7329 Silverado Trail
Yountville, CA 94559

California State Lands
Commission
c/o Diana Jacobs, Ecologist
100 Howe Avenue, Suite 100 South
Sacramento, CA 95825

California State Lands
Commission
c/o Linda Fiack
1807 13th Street
Sacramento, CA 95814

California State Lands
Commission
c/o Jim Frey
1807 13th Street
Sacramento, CA 95814

California State Lands
Commission
c/o Dwight Sanders
100 Howe Avenue, Suite 100
Sacramento, CA 95825

California Department of
Conservation
c/o Pat Meehan
801 K Street
Sacramento, CA 95814

California Regional Water
Quality Control Board
North Coast Region
c/o Cathleen Goodwin
5550 Skylane Blvd., Suite A
Santa Rosa, CA 95403

California Regional Water
Quality Control Board
North Coast Region
c/o Robert Klampert
Monitoring & Planning Supervisor
5550 Skylane Blvd., Suite A
Santa Rosa, CA 95403

California Regional Water
Quality Control Board
North Coast Region
c/o Bruce Gwynn
5550 Skylane Blvd., Suite A
Santa Rosa, CA 95403

California Regional Water
Quality Control Board
North Coast Region
c/o Philip Wyels, Esq.
5550 Skylane Blvd., Suite A
Santa Rosa, CA 95403

California State Coastal
Commission
c/o Laurel Marcus, Project
Director
1330 Broadway, Suite 1100
Oakland, CA 94612

California Department of Water
Resources
c/o Gerald Boles
2440 Main Street
Red Bluff, CA 96080

California Department of Water
Resources
c/o John Ensich
3251 S Street
Sacramento, CA 95814

California Department of Water
Resources
c/o Mike Floyd
3251 S Street
Sacramento, CA 95814

California Department of
Pesticide Regulation
c/o Carissa Ganapathy
P.O. Box 942871
Sacramento, CA 94271-0001

California Farm Bureau
c/o David Guy
1691 Exposition Blvd.
Sacramento, CA 95816

California Department of Health
Services
Drinking Water Operations Branch
c/o Bruce Burton, District
Engineer
50 D Street, Suite 200
Santa Rosa, CA 95404

**RUSSIAN RIVER MAILING LIST
COUNTY/CITY AGENCIES**

City of Santa Rosa
c/o Don Carlson
Capitol Project Coordinator
69 Stony Circle
Santa Rosa, CA 95401

City of Ukiah
c/o George Borecky,
Superintendent
300 Seminary Ave.
Ukiah, CA 95482

City of Cloverdale
c/o Bob Perrault
P.O. Box 217
Cloverdale, CA 95425

City of Healdsburg
c/o Richard Pusich
Director of Public Works
P.O. Box 578
Healdsburg, CA 95448

City of Ukiah
c/o Fred Schneider, Mayor
300 Seminary Ave.
Ukiah, CA 95482-5400

City of Healdsburg
c/o Bill Robertson
P.O. Box 578
Healdsburg, CA 95448

City of Santa Rosa
c/o Dan Carlson
69 Stony Circle
Santa Rosa, CA 95401

City of Santa Rosa
c/o Frank Kasimov
100 Santa Rosa Ave.
Santa Rosa, CA 95404

County of Mendocino
Department of Agriculture
c/o Commissioner's Office
579 Low Gap Road
Ukiah, CA 95482

County of Mendocino
c/o Michael Scannell
County Administrator
Courthouse
Ukiah, CA 95482

County of Mendocino
Department of Planning
c/o Alan Falleri
501 Low Gap Road, Room 1440
Ukiah, CA 95482

Mendocino County Farm Bureau
c/o Carre Brown
303-C Talmage Road
Ukiah, CA 95482

Mendocino County Water Agency
c/o General Manager
Courthouse
Ukiah, CA 95482

Mendocino County Russian River
Flood Control and Water
Conservation District
c/o Thomas Johnson
525 South Main Street, Suite B
Ukiah, CA 95482

Mendocino County
c/o Gary Akerstrom
425 Talmage Road
Ukiah, CA 95482

Mendocino County
c/o Neal Mettler
890 North Bush
Ukiah, CA 95482

Mendocino County
c/o John Rodgers
890 North Bush
Ukiah, CA 95482

Russian River County Water
District
7131 Mirabel Road
Forestville, CA 95436

Sonoma County
Farm Bureau
c/o Karen Thomas
970 Piner Road
Santa Rosa, CA 95403

Sonoma County
Farm Bureau
c/o Bev Wason
P.O. Box 158
Rio Nido, CA 95471

Sonoma County
c/o Don Smith
1030 Center Drive, Suite A
Santa Rosa, CA 95403-2067

Sonoma County Water Agency
c/o Helena Arneson
2150 West College Avenue
Santa Rosa, CA 95401

Sonoma County Water Agency
c/o Jim Flugum
2150 West College Avenue
Santa Rosa, CA 95401

Sonoma County Water Agency
c/o Jill Golis
2150 West College Avenue
Santa Rosa, CA 95401

Sonoma County
Agriculture Commission
c/o Eric Lauritzen
2604 Venture Ave., Room 101
Santa Rosa, CA 95403-2810

Sonoma County
c/o Levi Gurule, Deputy Director
575 Administration Drive
Santa Rosa, CA 95403

Sonoma County Water Agency
c/o Randy Poole, General Manager
2150 West College Avenue
Santa Rosa, CA 95401

Sonoma County
c/o David Schiltgen
575 Administration Drive
Santa Rosa, CA 95403

Sonoma County
Planning Department
c/o Greg Carr
575 Administration Drive
Santa Rosa, CA 95403

Sonoma County
Permit and Resources Division
c/o Pete Parkenson
2550 Ventura Avenue
Santa Risa, CA 95403

Sonoma County
Regional Parks
c/o Phillips Sales
2300 Country Center Drive
Santa Rosa, CA 95405

Sonoma County
Sanitation District
c/o Bob Rawson
Industrial Waste Supervisor
5135 Ross Road
Sebastopol, CA 95472

Sonoma County
Planning Department
c/o Bob Gaiser
575 Administration Drive
Santa Rosa, CA 95403

Town of Windsor
c/o John Johnson
Director, Public Works
P.O. Box 100
Windsor, CA 95492-0100

Town of Windsor
c/o Berton Willis
P.O. Box 100
Windsor, CA 95492-0100

**RUSSIAN RIVER MAILING LIST
ENVIRONMENTAL SPECIAL INTERESTS GROUPS**

California Sportfishing
Protection Alliance
c/o Jim Crenshaw, President
1248 Oak Avenue, Suite D
Woodland, CA 95695

California Trout, Inc.
c/o Jim Edmondson, Executive
Director
9770 Sombra Terrace
Shadow Hills, CA 91040

California Sportfishing
Protection Alliance
c/o Bob Baiocchi
P.O. Box 357
Quincy, CA 95971

California Trout, Inc.
c/o Michael Bowen
870 Market Street, Suite 859
San Francisco, CA 94102

Ducks Unlimited
c/o Timothy Fitzpatrick
465 Healdsburg Ave.
Healdsburg, CA 95448

Friends of The Eel River
c/o Nadananda
P.O. Box 1413
Redway, CA 95560

Friends of Eel River
c/o Glenn Macbeth
P.O. Box 147
Phillipsville, CA 95559

Friends of the Russian River
c/o Tom Roth, Executive Director
P.O. Box 329
Cazadero, CA 95421

Friends of the Russian River
c/o Marty Roberts
P.O. Box 9234
Santa Rosa, CA 95404

Friends of the Russian River
c/o Fred Beeman
613 Sparks Road
Sebastopol, CA 95472

Friends of the Russian River
c/o David Borling
P.O. Box 747
Glen Ellen, CA 95442

Institute of Environmental
Resources
717 K Street, Suite 224
Sacramento, CA 95814

Natural Heritage Institute
114 Sansome Street, Suite 1200
San Francisco, CA 94104

Natural Heritage Institute
c/o Richard Ross-Collins
114 Sansome Street, Suite 1200
San Francisco, CA 94104

Northern California Trout
Unlimited
c/o Stan Griffin
5200 Huntington Ave., Room 300
Richmond, CA 94804

Russian River Watershed
c/o Brenda Adelman
P.O. Box 501
Guerneville, CA 95446

Salmon Unlimited
23211 East Side Road
Willits, CA 95490

Salmon Unlimited
c/o Michael Monford
23211 Eastside Road
Willits, CA 95490

Salmon Unlimited
c/o Bill Townsend
P.O. Box 765
Ukiah, CA 95482

Salmon Restoration Federation
P.O. Box 4260
Arcata, CA 95521

Sierra Club
c/o Len Swenson
P.O. Box 466
Santa Rosa, CA 95402

Sierra Club
Legal Defense Fund
c/o Stephen Volker
180 Montgomery Street, Suite 14
San Francisco, CA 94104

Trout Unlimited, Inc.
c/o Doug Gore
448 Pleasant Hill Road
Sebastopol, CA 94572

Trout Unlimited, Inc.
c/o Michael Swaney
950 Litchfield Ave.
Sebastopol, CA 95472

Trout Unlimited, Inc.
c/o Jim Tischler
11900 Mill Street
Petaluma, CA 94952

United Anglers of California
c/o John Beuttler
Executive Director
5200 Huntington Ave., Room 300
Richmond, CA 94804

**RUSSIAN RIVER MAILING LIST
INTERESTED PARTIES**

Ad Hoc Committee for Clean Water
c/o Ann Maurice
P.O. Box 484
Occidental, CA 95421

Alexander Valley Association
c/o Dennis Murphy
4950 West Soda Rock Lane
Healdsburg, CA 95448

Atascadero-Green Valley Creeks
Association
c/o John Herrick
1620 Bollinger Lane
Sebastopol, CA 95472

Camp Meeker Parks and Recreation
c/o Chris Reiner
P.O. Box 461
Camp Meeker, CA 95419

Chevron
c/o Mike Bosworth
575 Market Street
San Francisco, CA 94105

Citizens For Cloverdale
c/o Krista Rector
147 Healdsburg Ave.
Cloverdale, CA 95425

Coastal Conservancy
c/o Richard Retecki,
Joan Cardellino
1330 Broadway, Suite 1100
Oakland, CA 94612

Committee For Sensible Reuse
c/o Steve Klausner
2361 Warm Springs Road
Glen Ellen, CA 95442

Covelo Indian Community
c/o James Shupe
P.O. Box 448
Covelo, CA 95428

Dry Creek Valley Association
c/o Don Frank
P.O. Box 1212
Healdsburg, CA 95448

Eel-Russian Rivers Commission
c/o Linda Bailey
Courthouse
Ukiah, CA 95482

Foothills Property Homeowners
Association
c/o William Anderson
P.O. Box 497
Fulton, CA 95439

Goldridge Resource
Conservation District
c/o Chairman, Board of Directors
874 Gravenstein Hwy., So., Ste.
6
Sebastopol, CA 95472

Johnson & DeMarchi
525 South Main Street, Suite B
Ukiah, CA 95482

Kiwi Kayak Company
c/o Anne Dwyer, President
P.O. Box 1140
Windsor, CA 95492

Laguna de Santa Rosa Foundation
c/o Kim Cordell
P.O. Box 797
Sebastopol, CA 95473

Louisiana-Pacific Corporation
c/o Lyman King
P.O. Box 340
Capella, CA 95418

Marin Municipal Water District
c/o Pam Nicolai, General Manager
220 Nellen Ave.
Corte Madera, CA 94925-1169

Mendocino County Farmers
c/o John Johnson
P.O. Box 748
Ukiah, CA 95492

Mendocino Resources
Conservation District
c/o Chairman, Board of Directors
405 Orchard Ave.
Ukiah, CA 95482

Mendocino Environmental Center
c/o Ellen Faulkner
160 Standley
Ukiah, CA 95482

North Marin Water District
c/o Chris DeGrabriele
General Manager
P.O. Box 146
Novato, CA 94948

Open Space District
c/o Dave Hansen
415 Russell Ave.
Santa Rosa, CA 95403

Pacific Gas & Electric Company
c/o Tom Jereb
Hydro-Development
77 Beale Street
San Francisco, CA 94106

Pacific Coast Federation
of Fisherman's Association
c/o Nat Bingham, Staff Director
P.O. Box 783
Mendocino, CA 95400

Pacific Gas & Electric Company
c/o John Torrens
925 L Street, Suite 890
Sacramento, CA 95814

Pacific Coast Federation
of Fisherman's Association
c/o Zeke Grader, Exec. Dir.
P.O. Box 989
Sausalito, CA 95925

Pacific Gas & Electric Company
c/o Rhinda Shifman
P.O. Box 770000 (MC#N11C)
San Francisco, CA 94177

Public Employees for
Environmental Responsibility
c/o Jeff DeBonis, Exec. Dir.
2001 S Street, Suite 570
Washington, DC 20009-1125

Resources Conservation District
c/o Bill Palmer
P.O. Box 35
Duncan Hill, CA 95430

Russian River Watershed
Protection Committee
c/o John Rosenblum
5650 Volkert
Sebastopol, CA 95472

Russian River Task Force
c/o Susan Brandt-Hawley
P.O. Box 1659
Glen ellen, CA 95442

Russian River Watershed
Protection Committee
c/o Brenda Adelman
P.O. Box 501
Guerneville, CA 95446

Russian River Community Water
c/o Richard McGowen
11447 Terrace Drive
Forestville, CA 95436

Russian River Unlimited
c/o Rebecca Kress
P.O. Box 760
Hopland, CA 95449

Russian River Task Force
c/o Martin Griffin
P.O. Box 66
Healdsburg, CA 95448

Russian River Chamber of
Commerce
c/o Lynn Crescione
P.O. Box 331
Guerneville, CA 95446

Santa Rosa Sotoyome Resources
c/o Chairman, Board of Directors
P.O. Box 11526
Santa Rosa, CA 95406

Sequoia Paddling Club
c/o Tom Meldau
10200 Wohler Road
Healdsburg, CA 95448

Sonoma County
Conservation League
c/o Mark Green
540 Pacific Ave.
Santa Rosa, CA 95404

Ya-Ka-Ama
c/o Luwana Quitquit-Harrison
Executive Director
6215 Eastside Road
Forestville, CA 95436

Sonoma Ecology Center
c/o Richard Dale
205 First Street West
Sonoma, CA 95476

Sonoma County EIR
c/o Juliana Doms, Publisher
321 S. Main Street
Sebastopol, CA 95403

Sonoma County Watershed Council
c/o Dion Hardy
P.O. Box 583
Occidental, CA 95465

Sotoyome-Santa Rosa Resources
Conservation District
c/o Glenda Humiston
P.O. Box 158
Rio Nino, CA 95471

Sweetwater Springs Water Dist.
c/o Michael Torr
9725 Main Street
Monte Rio, CA 95462

United Winegrowers for Sonoma
c/o Bob Anderson
P.O. Box 382
Santa Rosa, CA 95402

UNOCAL
c/o Rob Dickerson
1300 North Dutton Ave.
Santa Rosa, CA 95401

UNOCAL
c/o Eric Steger
HEC Coordinator
UNOCAL Geothermal
3576 UNOCAL Place
Santa Rosa, CA 95403-1774

Westside Wineries Task Force
c/o Martin Griffin
6050 Westside Road
Healdsburg, CA 95448

**RUSSIAN RIVER MAILING LIST
INTERESTED PERSONS**

Meg Alexander
538 Tucker Street
Healdsburg, CA 95448

Alfred Belluomini
P.O. Box 2
Fulton CA 95439

Susan Bierwirth
511 Fitch
Healdsburg, CA 95448

Michael Boer
P.O. Box 218
talmage, CA 95481

Pat Bond
P.O. Box 484
Forestville, CA 95436

Robert Bowen
P.O. Box 2418
Sebastopol, CA 95473-2418

Barbara Bozman-Moss
214 Almond Way
Healdsburg, CA 95488

Steven Breithaught
University of Davis
Davis, CA 95401

Ellen McHugh Carol
Co-Editor
Russian River Bulletin
P.O. Box 11628
Santa Rosa, CA 95406

Moiria Chatton
P.O. Box 1341
Healdsburg, CA 95448

Walt Chavor
Paducci Wine Cellars
501 Paducci Road
Ukiah, CA 95482

Ken Craven
2360 Professional Drive
Santa Rosa, CA 95403

John DeGeorge
University of Davis
Davis, CA 95401

Mike Dias
2119 Camino Court
Davis, CA 95616

Juliana Doms
P.O. Box 1834
Sebastopol, CA 95473

Katie Etienne
12779-A Bodega Highway
Freestone, CA 95472

Linda Farren
4775 Thomas Road
Sebastopol, CA 95472

John Fay
SYAR Industries
P.O. Box 325
Healdsburg, CA 95448

Barney Fernandez
Ferrari-Carano Vineyards
P.O. Box 1549
Healdsburg, CA 95448

Matthew Frey
14000 Tomki Road
Redwood Valley, CA 95470

Karen Gaffney
Circuit Rider productions
9619 Old Redwood Highway
Windsor, CA 95492

Mary Goodwin
P.O. Box 321
Capella, CA 95418

Don Gowan
6100 Highway 128
Philo, CA 95466

Julie Grantz
44 Cinnamon Teal Lane
Ignacio, CA 94949

Doug Green
P.O. Box 34
Cazadero, CA 95421

Doug Grigg
3153 Pacific
San Francisco, CA 94115

Matt Haiken
P.O. Box 1089
Healdsburg, CA 95448

Charles Hanson
132 Cottage Lane
Walnut Creek, CA 94595

Terry Harrison
Sonoma Antique Apple Nursery
4395 Westside Road
Healdsburg, CA 95448

Steve Hart
Press Democrat
P.O. Box 569
Santa Rosa, CA 95402

Elizabeth Herron
8330 Valley View Court
Sebastopol, CA 95472

Brian Hines
1468 Funston Drive
Santa Rosa, CA 95407

Susan Hirsch
Sonoma County Day School
50 Mark West Spring Road
Santa Rosa, CA 95404

Aletta Hollister
P.O. Box 111
Comptche, CA 95427-0111

Robert Hopkins
8300 Eastside Road
Healdsburg, CA 95448

Olivia Hou
Rancho Cotati High School
7190 Camino Colegio
Rohnert Park, CA 94928

Glenda Humiston
P.O. Box 158
Rio Nido, CA 95471

Ron Kaiser
Sonoma Farm Trails
7097 Westside Road
Healdsburg, CA 95448

Scott Kersnar
17300 Watson Road
Guerneville, CA 95446

Chris Kjeldson
Sonoma State University
1801 East Cotati Ave.
Rohnert Park, CA 94928

Nell Kneibler
735 Grant Ave.
Healdsburg, CA 95448

Gene Koch
P.O. Box 824
Occidental, CA 95465

Mathias Kondolf
University of California,
Berkeley
202 Wurster Hall
Berkeley, CA 94720

Page Leonard
22085 Bonness Road
Sonoma, CA 95476

Helen Libue
4715 Guerneville Road
Santa Rosa, CA 95403

Parker Mahoney
P.O. Box 77
Guerneville, CA 95446

Jame McCrumb
P.O. Box 243
Cazadero, CA 95421

Harry Meyn
5210 Gates Road
Santa Rosa, CA, 95404

Robert Miller
Local Union #3
3900 Mayette Ave.
Santa Rosa, CA 95405

Emma Mitchell
P.O. Box 574
Talmage, CA 95481

Harry Moore
17 Harding Drive
Novato, CA 94947

Daniel Myer
P.O. Box 178
Philo, CA 95466

Chris Peterson
Rancho Cotati High School
5450 Snyder Land
Rohnert Park, CA 94928

Lisa Posteruick
8471 Lancaster Drive
Rohnert Park, CA 94928

Jean-Michel Poulnot
2705 Iroquois Street
Santa Rosa, CA 95403

Davis Raff
4400 Gravenstein Highway, North
Sebastopol, CA 95472

Peggy Rawlins
17698 Healdsburg Ave.
Healdsburg, CA 95448

Karol Raymer
950 Vernal Ave.
Mill Valley, CA 94941

Dennis Ripple
Kaiser Sand & Gravel
7821 Eastside Road
Windsor, CA 95492

John Rosenblum
12942 DuPont Road
Sebastopol, CA 95472

Dave Sagehorn
7001 Eastside Road
Ukiah, CA 95482

Robert Scaglione
300 Ford Road
Ukiah, CA 95482

Paul Siri
University of California
P.O. Box 247
Bodega Bay, CA 94923

Albert Slendbrook
AARC
8701 Mill Creek
Healdsburg, CA 95448

Stuart Smith
19301 Rideway Highway
Potter, CA 95469

Dr. Robert Speirs
8717 State Highway 16
Brooks, CA 95606

Lynn Stafford
P.O. Box 121
Bodega Bay, CA 94923

Park Steiner
SEC
P.O. Box 250
Potter, CA 95469

Tony Stephen
Bruocao Vineyards
P.O. Box 740
Hopland, CA 95449

Anne Stubecker
Rancho Cotati High School
5450 Synder Lane
Rohnert Park, CA 94928

Ron Thelin
P.O. Box D
Forestville, CA 94933

Senator Mike Thompson
State Capitol, Room 3056
Sacramento, CA 95814

Nick Tibbetts
P.O. Box 15055
Santa Rosa, CA 95402

Johanna Vanoni
Vanoni Ranch
22900 River Road
Geyserville, CA 95441

Jerry Waxman
8207 West Dry Creek Road
Healdsburg, CA 95448

Richard Weston
P.O. Box 515
Windsor, CA 95492

Chip Wray
2081 Hyde Burndale Road
Sonoma, CA 95476

**RUSSIAN RIVER MAILING LIST
CONSULTANTS/ATTORNEYS**

Allen Lilly
Attorney at Law
Bartkiewicz, Kronick & Shanahan
1011 22nd Street, Suite 100
Sacramento, CA 95816-4907

Anne Schneider
Attorney at Law
2015 H Street
Sacramento, CA 95814-3109

Barry Epstein
Attorney at Law
Law Offices of Barry Epstein
4609 Dolores Ave.
Oakland, CA 94602

Blaydes & Associates
c/o Paula Blaydes
1275 4th Street, Suite 214
Santa Rosa, CA 95404

Dan Gallery
Attorney at Law
926 J Street, Suite 505
Sacramento, CA 95814

Garn, Stevens Associates
c/o John Garn
301-C North Main Street
sebastopol, CA 95472

Harding Lawson & Associates
c/o David Fee
P.O. Box 6107
Novato, CA 94948

HEC
c/o Dave Gorman
609 2nd Street
Davis, CA 95616

James Hanson Engineering
c/o Paula Whealan
444 North 3rd Street, Suite 400
Sacramento, CA 95814

James Vineyards Performance
c/o Jim Nelson
200 Perry Street
Ukiah, CA 95482

Janet Goldsmith
Attorney at Law
Kronick, Moskovitz, Teidemann &
Girard
400 Capitol Mall, 27th Floor
Sacramento, CA 95814-3363

Jim Goodridge, P.E.
P.O. Box 970
Mendocino, CA 95460

John Williams Consulting
875 Linden Lane
Davis, CA 95616

Kevin O'Brien
Attorney at Law
Downey, Brand, Seymour & Rohnwer
555 Capitol mall, 10th Floor
Sacramento, CA 95814-4686

Martha H. Lennihan
Attorney at Law
Law offices of Martha Lennihan
455 Capitol Mall, Suite 300
Sacramento, CA 95814-4406

Merritt-Smith Consulting
c/o Dave Smith
3675 Mt. Diablo Blvd., Suite 120
LaFayette, CA 94549

Michael Jackson
Attorney at Law
P.O. Box 207
Quincy, CA 95971

Murray, Burns & Kielen
c/o Marc Van Camp
1616 29th Street, Room 300
Sacramento, CA 95816

Napa Valley Vinweyards
Engineering
c/o Diane Wilson
176 Main Street, Suite B
St. Helena, CA 94574

Resources Management Associates
c/o Donald Smith
4171 Suisun Valley Road, Suite C
Suisun, CA 94585

Roy C. Hampton & Associates
c/o James Kuykendall
2435 Venice Drive East, Suite
115
Tahoe Keys, CA 96150

Tom Johnson
Attorney at Law
525 South Main Street, Suite B
Ukiah, CA 95482

Virginia Cahill
Attorney at Law
555 Capitol Mall, Suite 950
Sacramento, CA 95814

Zitney & Associates
c/o Greg Zitney
7 Villa Vista Court
Novato, CA 94947

STATE WATER RESOURCES CONTROL BOARD

P.O. BOX 100, Sacramento, CA 95812-0100

Office of Legislative and Public Affairs: (916) 657-1247
Water Quality Information: (916) 657-0687

Clean Water Programs Information: (916) 227-4400
Water Rights Information: (916) 657-2170

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARDS

NORTH COAST REGION (1)

5550 Skylane Blvd., Ste. A
Santa Rosa, CA 95403
(707) 576-2220

SAN FRANCISCO BAY REGION (2)

1515 Clay Street, Ste. 1400
Oakland, CA 94612
(510) 622-2300

CENTRAL COAST REGION (3)

81 Higuera Street, Ste. 200
San Luis Obispo, CA 93401-5427
(805) 549-3147

LOS ANGELES REGION (4)

320 W. 4th Street, Ste. 200
Los Angeles, CA 90013
(213) 576-8600

CENTRAL VALLEY REGION (5)

3443 Routier Road, Suite A
Sacramento, CA 95827-3098
(916) 255-3000

FRESNO BRANCH OFFICE

3614 East Ashlan Avenue
Fresno, CA 93726
(559) 445-5116

REDDING BRANCH OFFICE

415 Knollcrest Drive, Suite 100
Redding, CA 96002
(530) 224-4845

LAKETOWN REGION (6)

2501 Lake Tahoe Blvd.
South Lake Tahoe, CA 96150
(503) 542-5400

VICTORVILLE BRANCH OFFICE

15428 Civic Drive, Ste. 100
Victorville, CA 92392-2383
(760) 241-8583

COLORADO RIVER BASIN REGION (7)

73-720 Fred Waring Dr., Ste. 100
Palm Desert, CA 92260
(760) 346-7491

SANTA ANA REGION (8)

California Tower
3737 Main Street, Ste. 500
Riverside, CA 92501-3339
(909) 782-4130

SAN DIEGO REGION (9)

9771 Clairemont Mesa Blvd., Ste. A
San Diego, CA 92124
(619) 467-2952

STATE OF CALIFORNIA

Gray Davis, Governor

CALIFORNIA ENVIRONMENTAL

PROTECTION AGENCY

Winston H. Hickox, Secretary

STATE WATER RESOURCES

CONTROL BOARD

James M. Stubchaer, Chairman



